

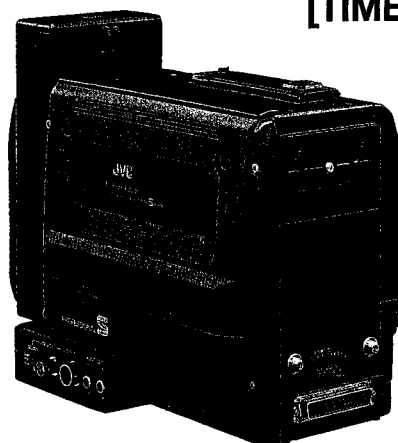
JVC

SERVICE MANUAL

VIDEO CASSETTE RECORDER

BR-S422E/SA-R200E

[TIME CODE GENERATOR(Optional)]



S VHS
625
VHS
PAL

Hi-Fi

SPECIFICATIONS

GENERAL

Format : VHS/S-VHS Europe standard
Signal system : PAL
Power requirement : DC 12 V
Power consumption : 13 W (Max. 38 W with camera)
Dimensions : 287.5 (W) x 244 (H) x 131.5 (D) mm
Weight : 3.3 kg, 4.3 kg with battery and cassette
Temperature
 Operating : 0°C to 40°C
 Storage : -20°C to 60°C
Operating humidity : 30% to 80 %
Tape width : 12.65 mm
Tape speed : 23.39 mm/sec
Recording and Playback time : 180 min. with SE-180

VIDEO

Y/C Input (50-pin camera connector)

Y : 1.0 Vp-p, 75 ohms, unbalanced
C : 0.3 Vp-p (burst), 75 ohms, unbalanced

Output

Composite : 1.0 Vp-p, 75 ohms, unbalanced (BNC)
Y/C : Y: 1.0 Vp-p, 75 ohms, unbalanced
C: 0.3 Vp-p (burst), 75 ohms, unbalanced

Signal-to-noise ratio : 45 dB
(Rohde and Schwarz noise meter)

Horizontal resolution : More than 400 lines (S-VHS)
More than 250 lines (VHS)

AUDIO






Number of tracks : 4 (Hi-Fi: 2/Normal: 2)
Input (Switchable)
 Line/MIC : -60 dBs, 3 k-ohms, balanced (Hi-Fi/Normal)
 +4 dBs, 10 k-ohms, balanced (Hi-Fi/Normal)
Output
 Line : -6 dBs, low impedance, unbalanced (Hi-Fi/Normal)
 Earphone : -60 to -12 dBs, 8 ohms
 Speaker : 0.5 W, 8 ohms
Dynamic range : More than 80 dB (Hi-Fi)
Frequency response : 20 to 20,000 Hz (Hi-Fi)
 50 to 10,000 Hz (Normal)
Signal-to-noise ratio : 42 dB (NR-off, Normal at 3 % distortion)
Wow & flutter : Less than 0.007 % WRMS (Hi-Fi)
 Less than 0.15 % WRMS (Normal)

ACCESSORIES

Provided accessory : Carrying handle x 1

Design and specifications subject to change without notice.

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Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

● Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the  symbol and shaded  parts are critical for safety.

Replace only with specified part numbers.

Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Fuse replacement caution notice.

Caution for continued protection against fire hazard.

Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:

- 1) Wires covered with PVC tubing
- 2) Double insulated wires
- 3) High voltage leads

5. Use specified insulating materials for hazardous live parts. Note especially:

- | | | |
|--------------------|--------------------------------------|------------|
| 1) Insulation Tape | 3) Spacers | 5) Barrier |
| 2) PVC tubing | 4) Insulation sheets for transistors | |

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

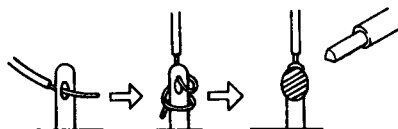


Fig. 1

7. Observe that wires do not contact heat producing parts (heat-sinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10–15 kg of force in any direction will not loosen it.

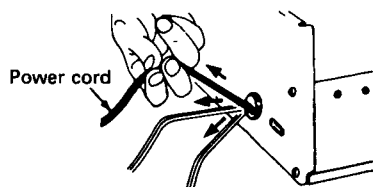


Fig. 2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)

In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector

In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.

1) **Connector part number :** E03830-001

2) **Required tool :** Connector crimping tool of the proper type which will not damage insulated parts.

3) **Replacement procedure**

(1) Remove the old connector by cutting the wires at a point close to the connector.

Important : Do not reuse a connector (discard it).

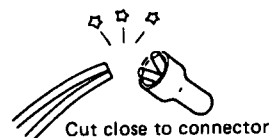


Fig. 3

(2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

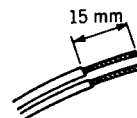


Fig. 4

(3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

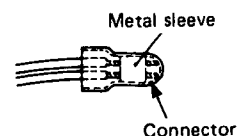


Fig. 5

(4) As shown in Fig. 6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

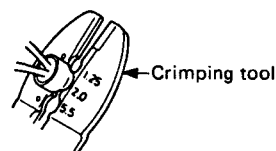


Fig. 6

(5) Check the four points noted in Fig. 7.

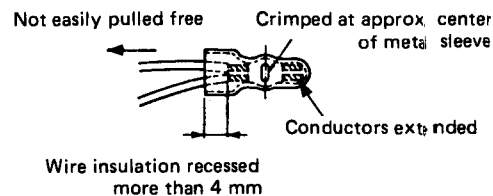


Fig. 7

● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions. Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. Insulation resistance test

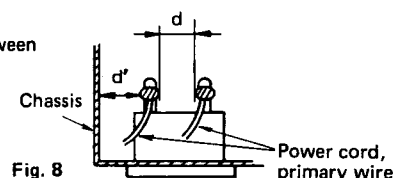
Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

2. Dielectric strength test

Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

3. Clearance distance

When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.



4. Leakage current test

Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).

Measuring Method: (Power ON)

Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

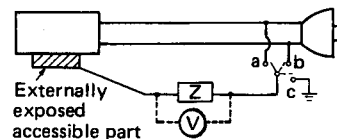


Fig. 9

5. Grounding (Class I model only)

Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).

Measuring Method:

Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.

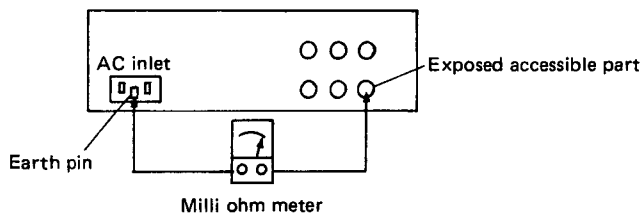


Fig. 10

Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	$Z \leq 0.1 \text{ ohm}$
Europe & Australia	$Z \leq 0.5 \text{ ohm}$

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	$R \geq 1 \text{ M}\Omega / 500 \text{ V DC}$	AC 1 kV 1 minute	$d, d' \geq 3 \text{ mm}$
100 to 240 V			AC 1.5 kV 1 minute	$d, d' \geq 4 \text{ mm}$
110 to 130 V	USA & Canada	—	AC 900 V 1 minute	$d, d' \geq 3.2 \text{ mm}$
110 to 130 V 200 to 240 V	Europe & Australia	$R \geq 10 \text{ M}\Omega / 500 \text{ V DC}$	AC 3 kV 1 minute (Class II) AC 1.5 kV 1 minute (Class I)	$d \geq 4 \text{ mm}$ $d' \geq 8 \text{ mm}$ (Power cord) $d' \geq 6 \text{ mm}$ (Primary wire)

Table 1 Specifications for each region

AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	$1 \text{ k}\Omega$	$i \leq 1 \text{ mA rms}$	Exposed accessible parts
110 to 130 V	USA & Canada	$0.15 \mu\text{F}$ and $1.5 \text{ k}\Omega$	$i \leq 0.5 \text{ mA rms}$	Exposed accessible parts
110 to 130 V 220 to 240 V	Europe & Australia	$2 \text{ k}\Omega$	$i \leq 0.7 \text{ mA peak}$ $i \leq 2 \text{ mA dc}$	Antenna earth terminals
		$50 \text{ k}\Omega$	$i \leq 0.7 \text{ mA peak}$ $i \leq 2 \text{ mA dc}$	Other terminals

Table 2 Leakage current specifications for each region

Note: These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

INSTRUCTIONS

JVC

BR-S422E

VIDEO CASSETTE RECORDER
VIDEOKASSETTENREKORDER
MAGNETOSCOPE A CASSETTE

S VHS
625

VHS
PAL

Hi-Fi



SAFETY PRECAUTIONS

WARNING:

TO PREVENT FIRE OR SHOCK HAZARD,
DO NOT EXPOSE THIS APPLIANCE TO
RAIN OR MOISTURE.

This unit should be used with 12 V DC only.

CAUTION:

To prevent electric shocks and fire hazards, do NOT
use any other power source.

NOTE:

The rating plate (serial number plate) is on the bottom of the
unit.

CAUTION

To prevent electric shock, do not open the cabinet. No user
serviceable parts inside. Refer servicing to qualified service
personnel.

This unit is produced to comply with Directives 76/889/EEC
and 82/459/EEC and 87/308/EEC.

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PRECAUTIONS

VCR

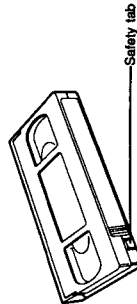
- Avoid using the recorder in places subject to the following conditions:
 - extreme heat, cold, or humidity,
 - dust,
 - near appliances generating strong magnetic fields, vibrations, and poor ventilation.
- Handle the recorder carefully.
 - Do not place anything heavy on the recorder.
 - Do not place any liquids on top of the recorder.
- During transportation,
 - Avoid violent shocks to the recorder during packing and transportation.
 - Before packing, be sure to remove the cassette from the recorder.

CONDENSATION

- Be careful of moisture condensation.
 - Do not use the recorder immediately after moving it from a cold place to a warm place. The water vapor in warm air will condense on the still-cold video head drum and tape guides and may damage the tape and the recorder.
 - When condensation occurs, the OPERATE LED will light red and the DEW indicator will appear on the display. In this case, the recorder cannot be operated except to eject the cassette tape. Wait a few hours until the video head dries and the DEW indicator goes off before using the video recorder again.
- Condensation is likely to occur under the following conditions:
 - When the recorder is moved from a cold place to a warm place.
 - Extreme humidity.
 - When a cold room is heated, under cool wind from an air conditioner, etc.

VIDEO CASSETTES

- This recorder uses S-VHS and VHS cassettes.
 - S-VHS: SE-120 for 120 minutes, SE-60 for 60 minutes, and SE-30 for 30 minutes of recording.
 - VHS: E-180 for 180 minutes, E-120 for 120 minutes, E-60 for 60 minutes, and E-30 for 30 minutes of recording.
- To prevent accidental erasure, remove the cassette's safety tab. To record on a cassette whose safety tab has been removed, cover the hole with adhesive tape.




- Avoid exposing the cassettes to direct sunlight. Keep them away from heaters.
- Avoid extreme humidity, violent vibrations or shocks, strong magnetic fields (near a motor, transformer or magnet) and dusty places.
- Place the cassettes in their cassette cases and position them vertically.
- Do not use tapes with a recording time of more than 180 minutes.
- Do not use S-VHS-C/VHS-C tapes using the cassette adapter, or the tape edge may be damaged during search.

FEATURES

2-Channel Hi-Fi and 2-Channel Linear Audio

To assure maximum audio flexibility and top-quality sound, the BR-S422E features two Hi-Fi audio channels and two linear audio channels. Using two rotary FM-audio heads to record Hi-Fi audio signals on a separate layer of tape, the Hi-Fi VHS system assures superb sound quality with extended frequency response of 20 Hz to 20 kHz, a dynamic range of 80 dB, and virtually no wow and flutter. Dolby B* noise reduction is provided for the linear channels. To maintain the highest level of audio performance, balanced XLR audio input connectors are provided. Input levels are switchable between -60 dB and -4 dB to allow connection of professional microphones for interviews and other applications.

- Dolby and the Double-D symbol  are trademarks of Dolby Laboratories Licensing Corporation.

Other Features

- Built-in AEQ generator
- Built-in loudspeaker
- REC REVIEW function
- Rotary erase heads
- Backlit LCD audio meter
- LCD display shows time counter data, lap time, and tape remaining time
- Heavy-duty diecast aluminum chassis
- LED operation indicators
- Battery power remaining indicator
- 5999H hour meter (switchable from tape counter)
- Self-diagnostic and maintenance-oriented design
- Video/Hi-Fi audio insert editing function

New Compact, Lightweight Design

At only 3.3 kilograms (not including tape and battery), the BR-S422E is the lightest dockable recorder in its class and its new streamlined compact design makes it easier to carry and less susceptible to breakage. Dockable with most JVC KY-series cameras, the BR-S422E offers you a level of convenience and mobility that no other mid-level recorder can match. Power consumption has also been reduced so you'll have to change batteries less often. And, since the BR-S422E uses full-size S-VHS tapes, up to 3 hours of recording is possible on a single tape.

High-Quality S-VHS Pictures

To provide pictures with detail and clarity, the BR-S422E incorporates JVC's advanced S-VHS technology for high-quality pictures with resolution of more than 400 lines. In addition, a 62-mm standard drum is used to ensure the best possible picture performance with minimal jitter. VHS recording is also possible.

Quick-Response Recording Start

In ENG applications, a few seconds can mean the difference between getting a shot and missing it altogether. To make sure you can start shooting the action as soon as it starts, the BR-S422E features a newly-developed Quick-Response Recording Start mechanism. You'll be able to go from the Rec-Pause mode to the Record mode in barely 1.3 seconds — with no distortion between takes. And if you want even faster response time, a newly-developed Quick AEF will start the recorder in about half a second.

Optional Plug-In Time Code Generator

To facilitate program-logging and simplify post-production, a plug-in Time Code Generator board (SA-P200E) capable of recording EBU-standard LTC or VITC time codes is available. Thanks to the BR-S422E's new rationalized design, the time code generator can easily be installed inside the recorder so there are no bulky extensions, and no significant additional weight. User bits featuring an internal real-time clock are provided for recording of additional data.

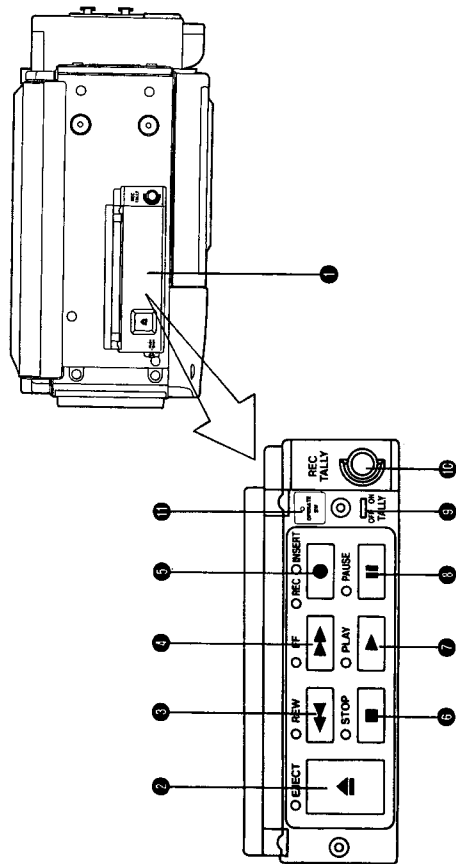
PROTECTIVE CIRCUITS

- OPERATE OFF during battery operation
 - During battery operation, the recorder is automatically set to OPERATE OFF to protect the recorder and battery pack if operation is continued when the OPERATE LED blinks red or beeps are heard from the speaker or EARPHONE jack. Replace the battery pack with a charged one. (When the recorder is set to OPERATE OFF while in the Record-Pause mode, the automatic record lock mechanism is engaged with the tape wrapped around the head drum.)
- To protect the tape
 - In the Record-Pause mode, the recorder automatically reduces the tape tension and drum rotation stops after about 30 minutes. If further recording is required, press the camera's VTR start/stop button, or press PLAY. The drum will start rotating and recording will restart after 8 or 10 seconds. If you want to return to the Record-Pause mode when drum rotation has stopped, press the camera's VTR start/stop button twice. When the Still or Insert-Pause mode has been engaged for a certain period of time, the tape protection circuit functions as shown in the table below.

Elapsed time	Tape movement
3 minutes, 30 seconds	Advances by a few frames.
7 minutes	Advances by an additional few frames.
10 minutes, 30 seconds	Enters the Stop mode.

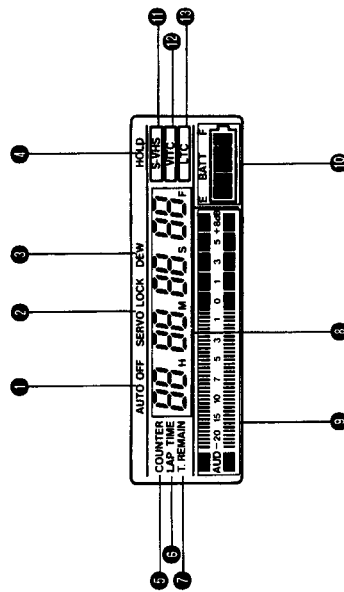
CONTROLS, INDICATORS AND CONNECTORS

OPERATION BUTTONS SECTION



- ➊ **Operation guard cover**
 - Prevents erroneous operations while shooting. Also functions as a dust cover. When it is opened with the POWER switch set to ON, the VCR enters the OPERATE ON mode. The OPERATE LED lights green and the display panel also comes on.
- ➋ **EJECT button**
 - Ejects the cassette when pressed in the Stop mode. If a camera is connected, cassettes can also be ejected in the Record-Pause mode. The LED lights during cassette ejection.
 - This button functions even when the operation guard cover is closed.
- ➌ **REW button**
 - Starts rewind when pressed in the Stop mode. When a tape is fully rewound, the VCR enters the Stop mode.
 - Starts high-speed reverse search at 7 times normal speed when pressed in the Play mode.
- ➍ **FF button**
 - Starts fast-forward when pressed in the Stop mode. When a tape is fully fast-forwarded, the VCR enters the Stop mode.
 - Starts high-speed forward search at 7 times normal speed when pressed in the Play mode.
- ➎ **REC/INSERT button**
 - Starts recording when pressed together with the PLAY button. (The PLAY and REC indicator light during recording.)
 - Engages the Insert-Pause mode when pressed together with the PAUSE button in the Record-Pause mode. (The INSERT and PAUSE button's indicators light.) If the PLAY button is pressed in the Insert-Pause mode, video/Hi-Fi audio insert editing will start. (cf p.23)
- ➏ **STOP button**
 - Stops the tape. If this button is pressed while the tape is running, the LED indicator lights and the tape is completely withdrawn into the cassette. This state is referred to as the Stop mode.
- ➐ **PLAY button**
 - Starts playback. The LED will light.
 - Re-starts normal playback when pressed in the Still mode.
 - Re-starts recording when pressed in the Record-Pause mode.
- ➑ **PAUSE button**
 - Temporarily stops recording when pressed in the Record mode. The tape will rewind for a few seconds, and then the Record-Pause mode will be engaged. (cf p.19)
 - Displays a still picture when pressed in the Play mode.
 - Engages frame advance when pressed in the Still mode.
- ➒ **TALLY ON/OFF switch**
 - Activates or deactivates REC TALLY LED.
 - ON: REC TALLY LED lights or blinks according to the situation.
 - OFF: REC TALLY LED is always off. Set to this position when REC TALLY is unnecessary or you want to save battery power.
- ➓ **REC TALLY indicator**
 - Lights when the VCR is in the Record mode.
 - Blinks when warning alarm is given.
- ➔ **OPERATE SW button**
 - Press to engage the OPERATE ON mode if the OPERATE LED doesn't light when the POWER ON/OFF switch is set to ON.

DISPLAY SECTION



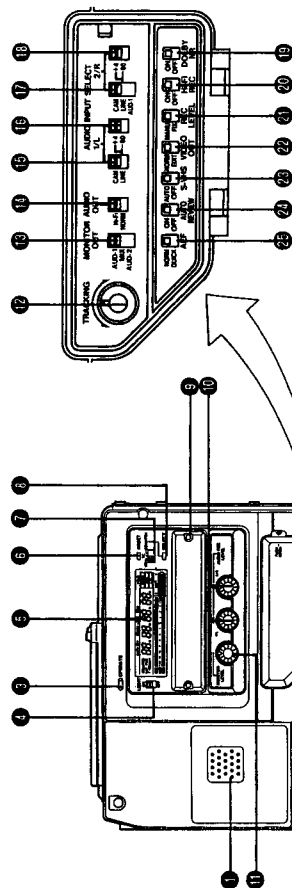
- ➊ **AUTO OFF indicator**
 - Comes on when malfunctions occur in tape running or in mechanism. (cf p.24)
- ➋ **SERVO LOCK indicator**
 - Comes on when the drum servo and capstan servo are out of their lock ranges or when there is no input video signal during recording.
- ➌ **DEW indicator**
 - Comes on when condensation occurs. All controls except EJECT become inoperative. (cf p.24)
- ➍ **HOLD indicator**
 - Comes on when the HOLD button is pressed with the optional SA-R200E time code generator installed. (cf p.26)
- ➎ **COUNTER indicator**
 - Comes on when the tape counter is selected with the SELECT button.
- ➏ **LAP TIME indicator**
 - Comes on when the lap time is selected with the SELECT button.
- ➐ **T.REMAIN indicator**
 - Comes on when the remaining tape time is selected with the SELECT button.
- ➑ **Counter display**
 - Displays tape counter, lap time, or remaining tape time.
 - Displays hour meter data.
 - Displays time code/user bits when the optional SA-R200E is installed. (cf p.26)
- ➒ **Audio level meter**
 - Shows the audio level during recording and playback. Switching between Normal and Hi-Fi audio is done with the AUDIO OUT select switch.
- ➓ **Battery Indicator**
 - Shows battery remaining time in 5 steps. When only 2 steps are left, the OPERATE and REC TALLY LEDs will start blinking red. (cf p.24)
- ➔ **S-VHS indicator**
 - Comes on when recording or playing back in the S-VHS mode.
- ➕ **VTC indicator**
 - Comes on when the VTC is recorded with the optional SA-R200E installed.
- ➖ **LTC indicator**
 - Comes on when the LTC is recorded with the optional SA-R200E installed.

NOTES:

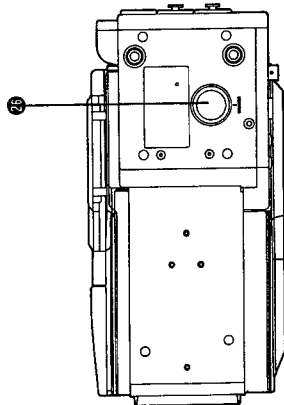
The BR-S422E's LCD panel may not work correctly if there is external interference noise. In this case, press the counter's RESET and SELECT buttons (cf p.7) simultaneously for several seconds. This will reset the internal microcomputer and recover normal operation.

- Keep in mind that stored time code data will be reset when the time code generator (SA-R200E) is installed.

CONTROLS AND SWITCHES SECTION



- **Speaker**
 - Sound selected with the AUDIO OUT or MONITOR OUT switch can be monitored through this speaker in the Record, Record-Pause, or Stop mode. In the Play mode, sound recorded on the tape can be monitored. When an earphone is plugged into the EARPHONE jack, no sound is available from the speaker.
- **POWER ON/OFF switch**
 - Emits various warning alarms. (See p.24)
- **OPERATE LED**
 - Set to ON to turn the power on.
 - Lights green in normal operation (during OPERATE ON).
 - Lights green when drum rotation is stopped in the Record-Pause mode.
- **LIGHT ON/OFF switch**
 - Lights or blinks red when malfunctions occur. (See p.24)
 - Set to ON to light the display panel.
 - Set to OFF to save power in battery operation.
- **Display panel** (See p.6)
- **RESET button**
 - Resets the tape counter and lap time.
- **UB/TC/COUNTER select switch**
 - Selects the display mode on the counter.
 - Displays time code user bits data.
 - Displays time code counter data.
 - Displays tape counter, lap time or remaining tape time. Selectable with the SELECT button.
- **SELECT button**
 - Switches the counter display between tape counter, lap time and remaining tape time when the UB/TC/COUNTER select switch is set to COUNTER.
 - **COUNTER:** Displays 4-digit tape counter.
 - **LAP TIME:** Displays elapsed tape time in hours, minutes and seconds. Lap time is not counted during REW/FF.
 - **T.REMAIN:** Displays remaining tape time in hours and minutes during recording. (Remaining tape time is updated once a minute.)
 - Indicates hour meter data when pressed together with the REC button (with cassette ejected). (See p.16)
- **TIME CODE GENERATOR operation guard cover**
 - Remove the cover when the optional SA-R200E time code generator is installed.
 - For SA-R200E operations, refer to p.25 "TIME CODE GENERATOR SA-R200E (OPTION)".
- **AUDIO REC LEVEL UP controls**
 - Adjusts audio recording level for audio-1(L) and audio-2(R) channels when the REC LEVEL switch is set to "MANU". Adjust the level so that the meter deflects to about 0 dB at peak input.
- **MONITOR LEVEL control**
 - Adjusts the output level from the monitor speaker.
 - Adjusts the EARPHONE jack output level from approx. -60 dBs to -12 dBs. (When the earphone's impedance is 8 ohms.)
 - The warning alarm's level is fixed and cannot be adjusted with this control. (The level can be increased with the internal control. Consult a JVC service centre or authorised JVC service agent.)

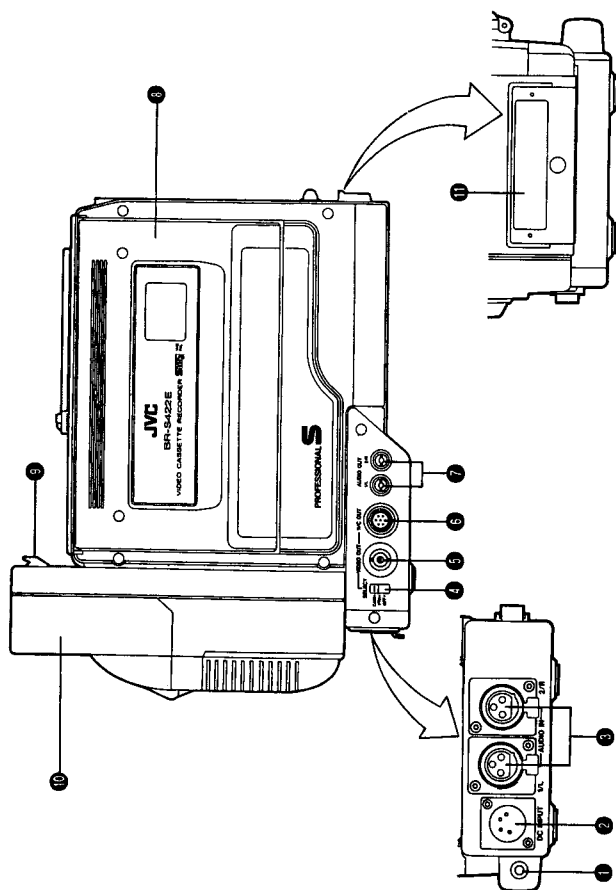


- **TRACKING control**
 - Turn to minimise noise bars in the pictures or breaks in the Hi-Fi sound. Normally set to the centre position.
- **MONITOR OUT select switch**
 - Selects the audio signal to be output from the speaker or EARPHONE jack.
 - **AUD-1(L):** To monitor the audio signal recorded on audio-1 or the left channel.
 - **MIX:** To monitor the mixed sound of audio-1(L) and audio-2(R).
 - **AUD-2(R):** To monitor the audio signal recorded on audio-2 or the right channel.
- **AUDIO OUT select switch**
 - Selects the audio signal for display on the audio level meter and for output from the AUDIO OUT terminals and monitor speaker.
 - **Hi-Fi:** Outputs/displays the Hi-Fi audio signals.
 - **NORM:** Outputs/displays the normal audio signals.
- **AUDIO INPUT SELECT switch (AUD-1/L)**
 - Selects the input signal (camera via 50-pin or Line AUD-1/L of AUDIO IN connector) to be recorded.
- **AUDIO INPUT SELECT switch (AUD-1/L level)**
 - Selects the input signal (camera via 50-pin or Line AUD-1/L of AUDIO IN connector) to be recorded.
 - Select +4 dB or -60 dB according to the level of the AUD-1/L line input signal.
- **AUDIO INPUT SELECT switch (AUD-2/R)**
 - Selects the input signal (camera via 50-pin, Line AUD-2/R of AUDIO IN connector or signal input to AUD-1/L) to be recorded.
- When set to AUD-1, the signal selected by the AUDIO INPUT SELECT (1/L) switch is input and will be recorded in monaural. Set to this position when the connected camera's microphone is monaural or only a single microphone is used.

- **AUDIO INPUT SELECT switch (AUD-2/R level)**
 - Select +4 dB or -60 dB according to the level of the AUD-2/R line input signal.
- **DOLBY NR ON/OFF switch**
 - Activates or defeats Dolby NR function for normal audio.
- **Hi-Fi REC ON/OFF switch**
 - Activates or defeats Hi-Fi sound recording.
- **REC LEVEL switch**
 - Selects automatic or manual recording level setting.
 - **MANU:** The audio recording level can be adjusted with the AUDIO REC LEVEL controls.
 - **FIX:** The audio recording level is fixed at the standard level.
- **VIDEO OUT switch**
 - **NORM:** Normally set to this position.
 - **EDIT:** Set to this position when using this recorder as a feeder in dubbing.
- **S-VHS select switch**
 - Selects the recording mode.
 - **AUTO:** The recording mode is switched automatically according to the type of cassette.
 - **OFF:** Set to this position when recording in the VHS mode with an S-VHS cassette.
- **AUTO REVIEW ON/OFF switch**
 - Activates or defeats AUTO REVIEW function in the Record-Pause mode. (See p.19)
- **AEF select switch**
 - Activates or defeats Automatic Editing Function. (See p.19)
 - **NORM:** AEF (Automatic Editing Function) is activated to prevent picture distortion at edit points in assembly recording.
- **QUICK:** The preroll time will be shorter for prompt response in recording; the picture at the edit point will be distorted.
- **Breaker**
 - When a camera with power consumption of 24 W or more is connected, this automatically turns the power off when the current exceeds the capacity.
 - If the Breaker cuts the power when the connected camera's power consumption is less than 24 W, press this button, then turn the power on and engage the OPERATE ON mode again. If normal operation is not restored, consult a JVC service centre or authorised JVC service agent.

POWER SUPPLY

CONNECTORS SECTION



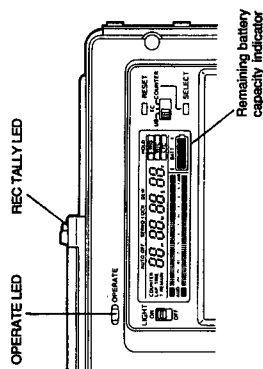
- **1 EARPHONE Jack**
 - Connect a 3.5 mm dia. earphone. (Monaural)
 - Outputs the audio signal selected with AUDIO OUT select switch or MONITOR OUT switch.
 - Also outputs various warning alarms. (cf p.24)
 - **2 DC INPUT**
 - Input connector for DC 12 V power supply. Connect the AA-G10E battery charger.
 - **3 AUDIO IN connectors (AUD-1/L, AUD-2/R)**
 - Audio input connectors for normal and Hi-Fi audio when the AUDIO INPUT SELECT switch is set to LINE for each channel.
 - **4 VIDEO OUT/Y/C OUT SELECT switch**
 - Selects the video signal to be output from the VIDEO OUT or Y/C OUT connector. (Audio signal is not chargeable.)
 - CAM: Through-outputs camera signal.
 - VTR: Outputs VTR's EE-picture or playback picture.
 - OFF: No video signal is output. Set to this position to save power.
 - **5 VIDEO OUT connector (BNC)**
 - **6 Y/C OUT connectors (7-pin)**
 - **7 AUDIO OUT connectors (AUD-1/L, AUD-2/R)**
 - Outputs audio signals selected with the AUDIO OUT select switch.
 - **8 Cassette cover**
 - **9 Battery case cover lock release button**
 - Open the battery case while pressing this button.
 - **10 Battery case**
 - Install the NB-G1U or an NP-1 type (Sony) battery pack. (cf p.11)
 - **11 D-Sub 50-pin connector**
 - Connect a video camera equipped with a 50-pin VTR docking connector. (DC 12 V outlet, max. 2A)
 - The RM-G410E editing control unit is not connectable.
- Sony is a registered trademark of Sony Corporation.

BATTERY OPERATION

- Use the NB-G1U or an NP-1 type (Sony) battery pack.
- The BATT indicator on the display shows the remaining battery capacity.
- When the battery power drops below a certain level, the battery alarm will sound and the OPERATE/REC TALLY LEDs will blink red to indicate that the battery pack needs recharging. In this case, replace the battery pack with a fully charged one.
- Sony is a registered trademark of Sony Corporation.

NOTES:

- When you supply power both from the DC input and the battery pack, power will be supplied first from the DC input.
- If the warning indications appear when the battery supplied from the DC input nears exhaustion (refer to p. 24), be sure to remove the battery connected to the DC input to switch the power supply source to the battery pack, otherwise switching of the power supply may not work properly.

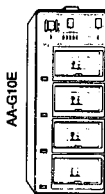


RECHARGING THE NB-G1U BATTERY PACK (Option)

- To charge the battery pack, use the AA-G10E battery charger.
- The AA-G10E can accept 4 battery packs at a time. One battery is charged at a time, taking about 80 to 90 minutes per battery pack. After the 4 battery packs have been charged in sequence, they are charged in parallel for an additional hour in the normal charging mode.
- 1. Insert a battery pack into each compartment of the AA-G10E with the contacts first and the pritted side to the left, until it locks onto place.
- 2. Press the AA-G10E's POWER button to ON.
- 3. Press the CHARGE button.

NOTES:

- Be careful not to over-charge the battery. Discharge the battery completely before recharging. If the battery is over-charged, the battery power may be reduced.
- For details, refer to the AA-G10E's instruction manual.



ATTACHING A BATTERY

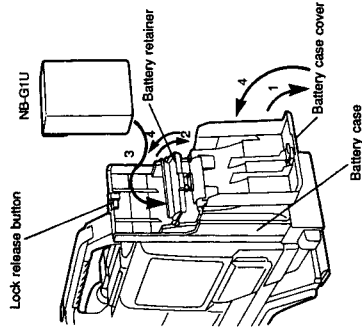
Attaching the NB-G1U battery pack

- Be sure the power is off when attaching.

- Open the battery case cover while pressing the lock release button.
- Pull the battery retainer down as shown by the arrow.
- Install the battery pack with its terminals facing the VTR.
- Pull up the battery retainer as shown by the arrow and replace the battery case cover.

NOTES:

- To exchange the battery pack, make sure that the POWER switch is set to "OFF".
- Be sure to shut the battery retainer first before replacing the battery case cover.



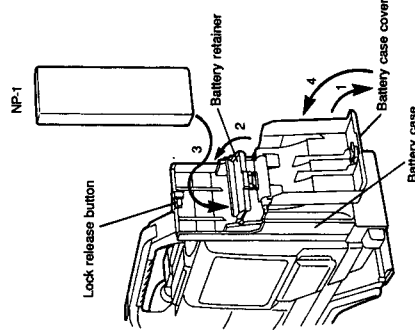
Attaching the NP-1 battery pack

- Be sure the power is off when attaching.

- Open the battery case cover while pressing the lock release button.
- Pull up the battery retainer as shown by the arrow.
- Install the battery pack with its terminals facing the VTR.
- Replace the battery case cover.

NOTES:

- To exchange the battery pack, make sure that the POWER switch is set to "OFF".



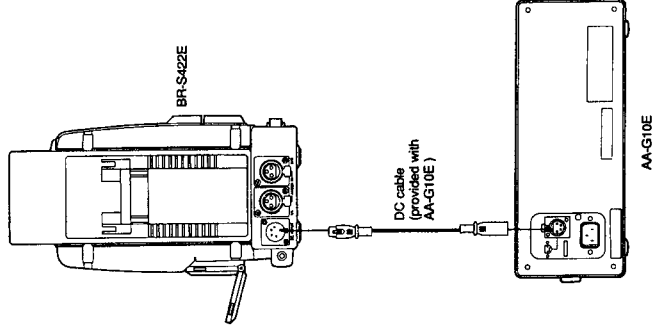
AC OPERATION VIA THE BATTERY CHARGER

- Be sure that the POWER switches of the BR-S422E and AA-G10E are set to "OFF".

- Connect the AA-G10E DC OUT connector and the BR-S422E DC IN connector with the DC cable provided with the AA-G10E.
- Set the AA-G10E VCR switch to "ON", then set the POWER switch to "ON".
- Set the BR-S422E POWER switch to "ON".

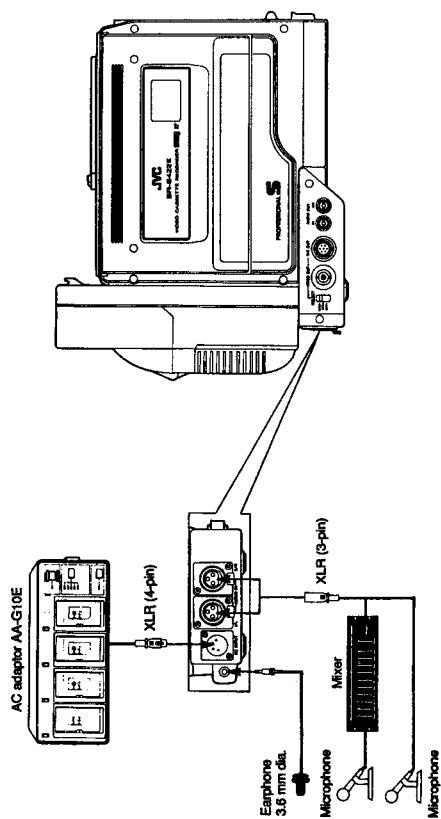
NOTES:

- Refer to the AA-G10E's instructions for details.

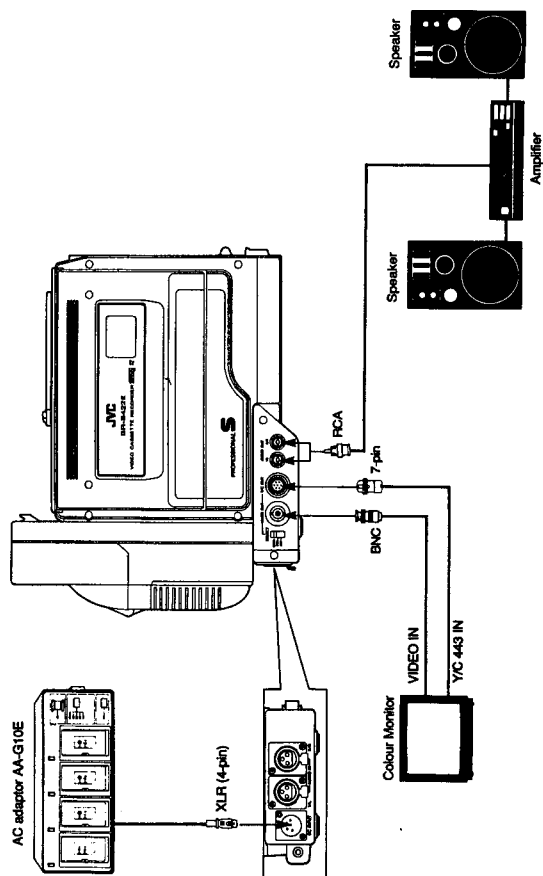


CONNECTIONS

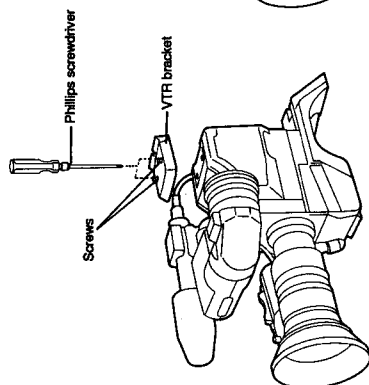
RECORDING



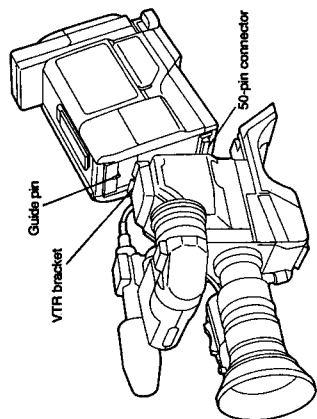
PLAYBACK



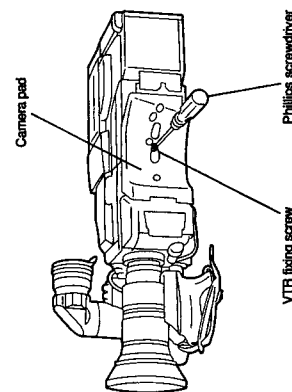
CONNECTING TO A CAMERA



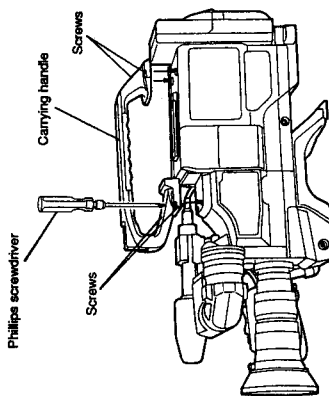
1. Detach the camera adapter from the camera. Attach the shoulder pad. When docking with the KY-27E, attach the VTR bracket as illustrated. (When installing the camera adapter on the KY-27E, the VTR bracket should be removed.)



2. Align the BR-S422E's guide pin with the V groove of the camera's VTR bracket after removing the cap of the 50-pin connector. Securely engage the BR-S422E's 50-pin connector to the camera's.



3. Secure the BR-S422E to the camera by inserting the VTR fixing screw through the camera's shoulder pad, using a Philips screwdriver.



4. Secure the provided carrying handle to the camera and the BR-S422E with four screws, using a Philips screwdriver as illustrated.

NOTES:

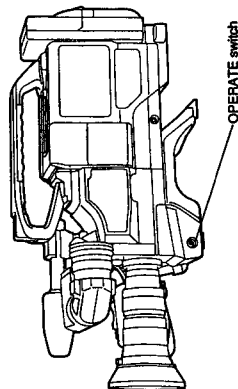
Be sure to match the camera microphone and camera impedance levels otherwise the audio level may be low when recorded. When using JVC cameras, we recommend use of the MV-P602U, MV-P612U, or M-K50U camera microphone.

PREPARATIONS

1. Set the POWER switch to "ON".

2. Recording

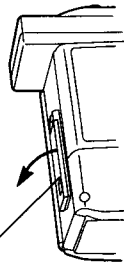
- Set the camera's OPERATE switch to "VTR STBY" to engage the OPERATE ON mode.
- Set the BR-S422E's AUDIO INPUT SELECT switch to either "CAM" or "LINE".
- Set the AUDIO INPUT LEVEL select switch according to the input signal level.



Playback

- Open the operation guard cover to engage the OPERATE ON mode.

Operation guard cover

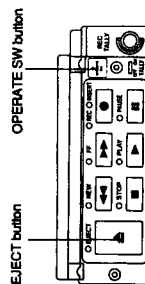


- If the OPERATE LED doesn't light when the POWER switch is set to ON, press the OPERATE SW button.

NOTES:

- When the DEW indicator blinks, do not load a cassette as condensation may have occurred. (c7 p.3)

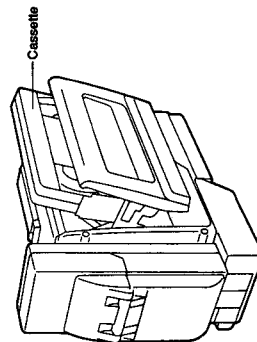
3. Press EJECT to open the cassette cover. The cover opens with the EJECT LED blinking.



4. Load the cassette. Close the cassette cover gently.
5. To take the cassette out of the holder, engage the Stop mode or the Record-Pause mode (when connected to the camera) before pressing the EJECT button.

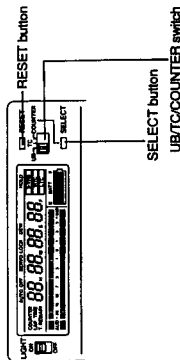
NOTES:

- The cassette cannot be ejected when the power is off.
- When the EJECT button is pressed in the Record-Pause mode, it takes about 7 seconds before the cassette is unloaded and the holder opens, as the tape is wrapped around the head drum in the Record-Pause mode.



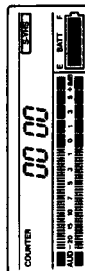
COUNTER DISPLAY

The BR-S422E's time counter shows tape time, lap time in hours, minutes, and seconds, and remaining tape time. (Lap time is not counted during REW/FF.) The counter can be switched to an hour meter data display which indicates the total drum rotating hours. When the optional SA-R200E timecode generator is installed, timecode/user bits display is also available. (c7 p.26)



Resetting the counter

In the tape counter and lap time modes, you can press the RESET button to reset the time counter to zero.



Remaining tape time display

You can check the remaining tape time in the Record mode.

1. Set the UB/TC/COUNTER switch to "COUNTER".
2. Press SELECT in the Record or Record-Pause mode until T.REMAIN appears on the display.
 - Counter shows the remaining tape time in hours and minutes.
 - The remaining time is updated once a minute.
3. Press SELECT again to return to the normal time counter.



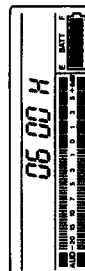
NOTES:

- For a short period of time after recording is started or during playback, rewind, or fast-forward, the remaining tape time will be shown as "--H--M".
- The remaining tape time may not be accurate when a E-240 cassette is used.

Hour meter data display

The counter display can also show the total drum rotating hours.

1. Eject the cassette.
2. Close the cassette cover.
3. Press REC and SELECT for more than 3 seconds.
 - Counter shows total drum rotating hours in 4 digits. (Unit is "hours")
 - If the cassette cover is opened, the hour meter display is not available.
4. Press STOP to return to the normal tape counter.



NOTES:

- For timecode/user bits display, c7 p.27, 28.

RECORDING

BASIC PROCEDURE

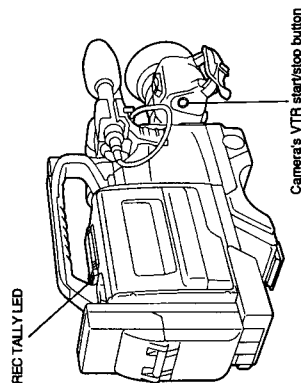
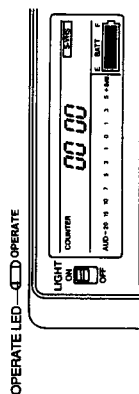
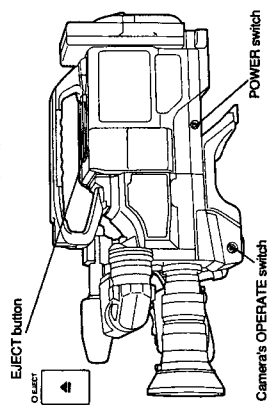
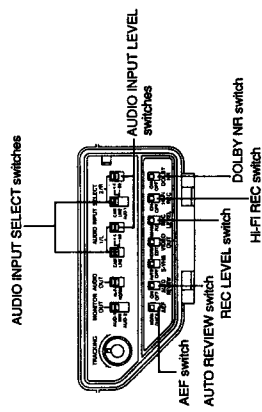
Make various settings as required before recording.

- Select the recording mode with the S-VHS select switch. (c7 p.18)
- Select the audio signal to be recorded for AUD-1 and AUD-2 with AUDIO INPUT SELECT switches. (c7 p.8)
- Select -4 dB or -60 dB with AUDIO INPUT LEVEL switch if you have set the AUDIO INPUT SELECT switch to "LINE".
- Set the Hi-Fi REC switch as desired. (c7 p.8)
- Set the DOLBY NR switch as desired. (c7 p.8)
- Set the REC LEVEL switch as desired. (c7 p.8)
- Set the AEF switch as desired. (c7 p.8)
- Set the AUTO REVIEW switch as desired. (c7 p.8)

1. Set the POWER switch to "ON".
2. Set the camera's OPERATE switch to "VTR SAVE" first, and then to "VTR STBY".
 - Power is supplied to the BR-S422E. The OPERATE LED lights green and the display panel comes on.
3. Press EJECT to open the cassette holder. Load the cassette correctly and close the cassette holder.

NOTES:

 - Tape loading starts after the cassette is loaded and the cassette holder is closed. It takes about 10 seconds before the Record-Pause mode is engaged.
4. Set the camera's switches. (Refer to the camera's instruction manual.)
5. Aim the lens at the subject and adjust the focus and zoom.



6. Press the camera's VTR start/stop button to start recording.
 - When this button is pressed, "REC Tally" in the viewfinder and the REC TALLY indicator blink 4 times a second. When the VCR enters the Record mode, the indicators stop blinking and remain steadily lit.
7. To stop recording, press the VTR start/stop button to engage the Record-Pause mode. To re-start recording, press it again.
8. To engage the Power save mode, set the camera's OPERATE switch to "VTR SAVE".
 - The BR-S422E's power is turned off in the Record-Pause mode (Rec-Lock mode). When the camera's OPERATE switch is set back to "VTR STBY", the VTR's power is activated again.

NOTES:

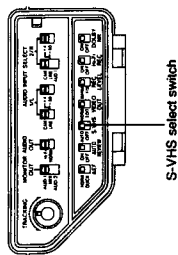
- When the VTR's power is re-activated, drum rotation may not be stable. Wait at least 8 seconds before restarting recording.
- If the Record-Pause mode continues for more than 30 minutes, drum rotation automatically stops and the OPERATE LED blinks green. If further recording is required, press the camera's VTR start/stop button or press PLAY. The drum will start rotating and recording will restart after 8 or 10 seconds. To return to the Record-Pause mode when drum rotation has stopped, press the camera's VTR start/stop button twice. Wait at least 8 seconds before restarting recording to ensure stable drum rotation.

SETTING THE S-VHS SELECT SWITCH

- Set the S-VHS select switch as required.

AUTO: The recording mode will automatically switch according to the type of cassette. When an S-VHS cassette is loaded, recording will be in the S-VHS mode; with a VHS cassette, it will be in the VHS mode.

OFF: Set to this position to record in the VHS mode with an S-VHS cassette. VHS cassettes will also be recorded in the VHS mode.

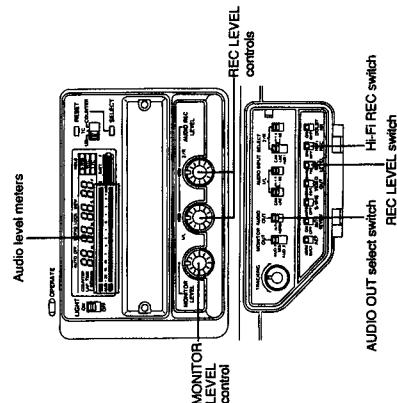


AUDIO LEVEL ADJUSTMENT

- Hi-Fi/Normal audio L/R levels can be adjusted with the AUDIO REC LEVEL controls.
1. Set the REC LEVEL switch to "MANU".
 2. Adjust the audio level so that the audio level meters deflect to about 0 dB when the loudest sound is input.
 - The audio level meters display either the Hi-Fi or normal audio level as selected with the AUDIO OUT select switch.
 - The REC LEVEL controls can adjust Hi-Fi and normal audio levels simultaneously.

NOTES:

- When set to "FIX", the REC LEVEL controls have no effect and the audio level is fixed at the standard level. The BR-S422E incorporates an audio limiter to avoid distortion with excessive input. However, the normal audio limiter circuit can be switched off with an internal switch. To do this consult a JVC service centre or authorised JVC service agent.
- When recording normal track sound only, set the Hi-Fi REC switch to "OFF".
- When the monitor volume level is set too high, howling may result.



AUTOMATIC EDITING FUNCTION (AEF)

This function helps prevent picture distortion at edit points in assemble recording.

- When the camera's VTR START/STOP button is pressed during recording, the tape rewinds by a few seconds and stops in the Record-Pause mode. When recording is restarted by pressing the camera's VTR START/STOP button, recording does not take place for the first 1.3 second period, during which time tracking is stabilised for a smooth transition to the next edit. (Back-space edit)
- In addition to the frame servo circuit, this recorder has rotary erase heads to realise smooth assemble edits without rainbow noise (colour beats). When the AEF switch is set to QUICK, the preroll time will be shorter (0.6 sec.) for prompt response in recording; the picture at the edit point will be distorted.

NOTES:

- The preroll function can be canceled by resetting an internal switch. To do this, consult a JVC service centre or authorised JVC service agent.

Auto Review Function

This function lets you confirm the quality of the recording on the viewfinder whenever the Record-Pause mode is engaged.

1. Set the camera's RET switch to "ON".
 2. Set the AUTO REVIEW switch to "ON".
 3. When the camera's VTR START/STOP button is pressed during recording, the last recorded segment is played back in reverse a little further than with the normal AEF, and the tape stops in the Record-Pause mode.
- With the AEF switch set to "NORM": the tape plays back in reverse for about 4 seconds, and stops in the Record-Pause mode.
 - With the AEF switch set to "QUICK": the tape plays back in reverse for about 3.5 seconds, and stops in the Record-Pause mode.

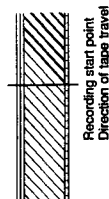
NOTES:

- Do not move the unit violently in the Record-Pause or Record-Lock mode, otherwise frames may be missed.

ROTARY ERASE HEADS

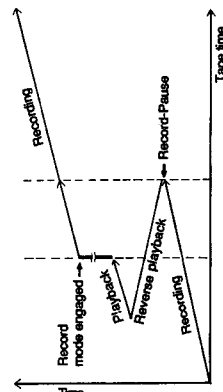
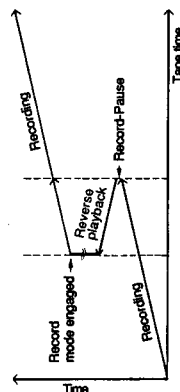
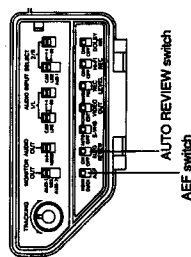
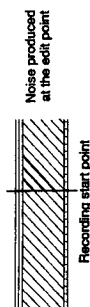
The rotary erase heads are mounted on the head drum to erase the video tracks before recording.

- Rotary erase head



During recording, the rotary erase head first erases the existing track, then the video head records the new video signal on it. In contrast to fixed erase head systems, rainbow noise and triangle noise do not appear at edit points with this system.

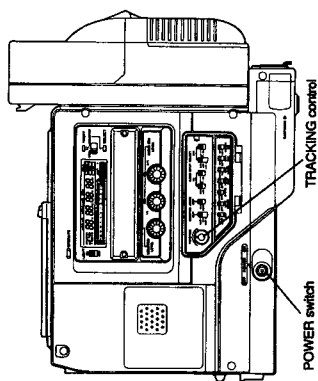
- Fixed erase head



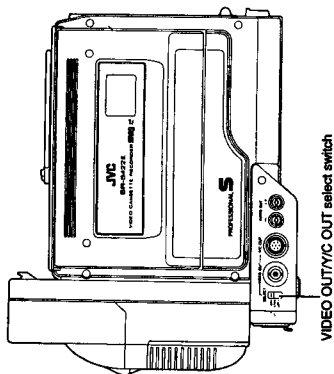
PLAYBACK

BASIC PROCEDURE

1. Set the BR-S42E's POWER to "ON", then open the operation guard cover. (OPERATE ON)



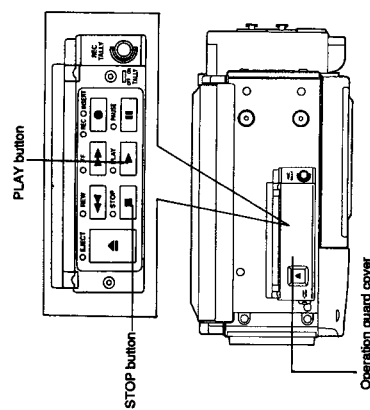
2. Set the VIDEO OUT/VC OUT select switch to "VTR".
3. Load a recorded cassette correctly.



4. Press PLAY to start playback.
5. Press STOP to stop playback.

NOTES:

- When viewing the playback picture on the viewfinder, set the RET switch to "ON". (When docked with JVC's KY-27E, the playback picture automatically appears on the viewfinder when the Play mode is engaged.)
- If noise appears on the playback picture, turn the TRACKING control until the noise disappears. Normally set the TRACKING control at centre position.

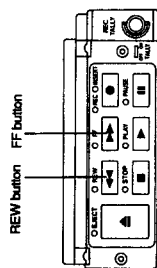


SEARCH FUNCTION

- Press REW in the Play mode for high-speed reverse search at 7 times normal speed. The search mode continues for as long as the button is pressed.
- Press FF in the Play mode for high-speed forward search at 7 times normal speed. The search mode continues for as long as the button is pressed.

NOTES:

- In the Search mode, there may be some noise, vertical picture vibration, or no colour. This is not due to any defect of the recorder.
- No Hi-Fi audio is output in the Search mode.

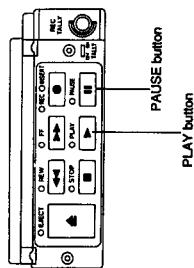


STILL AND FRAME ADVANCE

1. Press PAUSE to view a still picture in the Play mode.
2. Press PAUSE while in the Still mode to advance the picture frame by frame.
3. Press PLAY to resume normal playback.

NOTES:

- To protect the tape and video heads, the VCR will automatically advance the tape a few frames if the Still mode continues for about 3 minutes and 30 seconds. After about 10 1/2 minutes, the Stop mode is automatically engaged.
- Still pictures may contain some noise or vibrate vertically. This is not due to any defect of the recorder.



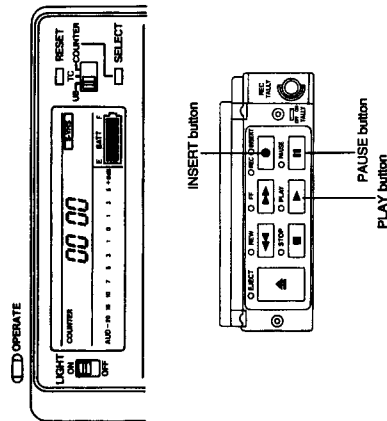
VIDEO/HI-FI AUDIO INSERT EDITING

The BR-S422E has an insert editing function which enables you to replace existing video and Hi-Fi audio tracks with new material.

- Connect a microphone to the BR-S422E.
- Set the AUDIO INPUT select switch and AUDIO INPUT LEVEL select switch as required.
- Set the camera's OPERATE switch to "CAM ON-VTR SAVE".
- Open the operation guard cover to engage the OPERATE ON mode.
- Play back the tape and press PAUSE at the position you wish to end insert editing (Insert OUT point). Reset the tape counter to "0000".
- Rewind the tape to the position you wish to start insert editing (Insert IN point).
- Press REC and PAUSE together in the Still mode. (The VCR preloads the tape and enters the Record-Pause mode.)
- Press REC and PAUSE together again to engage the Insert-Pause mode.
 - The INSERT and PAUSE buttons' LEDs light.
- Press PLAY to start insert editing.
 - The PLAY and INSERT buttons' LEDs light.
- The video and Hi-Fi audio tracks enter the Record mode and the normal audio track enters the Play mode.
- Press PAUSE to temporarily stop insert editing. The Insert-Pause mode is engaged. Press PLAY to re-start insert editing.
- Insert editing automatically stops at the counter "0000" position and the VCR enters the Play mode.
- To stop insert editing before "0000", press STOP. (The tape will unload.)

NOTES:

- Insert editing is not possible on cassettes with no safety tab.
- Normal audio insert editing is not possible.
- Hi-Fi audio will be replaced regardless of the setting of the Hi-Fi REC switch.
- Insert editing is not possible with a tape which does not contain control signals. If the tape reaches a non-recorded segment during insert recording, the VCR automatically enters the Play mode.
- If VCR remains in the Insert-Pause mode for more than about 10 minutes and 30 seconds, the recorder automatically unloads the tape and enters the Stop mode.
- To execute insert editing with best quality, be sure to adjust the tracking before editing.



WARNING MESSAGES

The BR-S422E has a comprehensive array of warning indicators. The following chart summarises the operation of the warning system.

Warning Indicators					
Warning	Remarks	OPERATE LED	REC TALLY	Display	Alarm sound
SERVO LOCK	Head drum and capstan are not locked during recording. No video signal input. (in Rec)	●	●	SERVO LOCK	— 滴滴 滴滴
AUTO OFF	Drum/capstan/reel malfunctions. Mechanism is abnormal.	●	●	AUTO OFF	滴滴 滴滴
DEW	Condensation warning.	●	●	DEW	滴滴 滴滴
TAPE END	About 3 minutes before tape end. (in Rec)	●	●	—	— 滴滴 滴滴
	Tape end.	●	●	—	滴滴 滴滴
	Slightly before the battery is exhausted.	●	●	E BATT F	滴滴 滴滴
BATTERY	Battery exhausted.	●	●	F BATT F	滴滴 滴滴

- In normal operation, the OPERATE LED light is green. When a malfunction occurs, it lights or blinks red depending on the situation.
- The alarm sound is superimposed on the audio output from the EARPHONE jack and the speaker.
- Camera Tally operation varies with different cameras.

● : Lights
● : Blinks 4 times a second
● : Blinks once a second
● : Blinks 4 times a second
● : Blinks once a second
● : Blinks 4 times a second
● : Blinks once a second

TROUBLESHOOTING GUIDE

Symptoms	Check points
No power is applied to the recorder.	<ul style="list-style-type: none"> Is the power unit connected correctly? Is the battery pack charged? Is the camera's OPERATE switch set to "VTR STBY" for camera recording? Is the operation guard cover opened for playback or insert editing?
Recording or insert editing cannot be started.	<ul style="list-style-type: none"> Is the safety tab of the cassette removed? Reseal the slot with adhesive tape. Is the LTC ON/OFF switch (x7 p. 26) set to "ON"? Even if the SA-R200E is not installed, no audio signal is output from AUD-2 when the LTC ON/OFF switch is set to "ON". Is the VIDEO OUT SELECT switch set to "OFF" or "CAM"? Set it to "VTR" for playback. Turn the TRACKING control.
Normal audio is not output from AUD-2.	<ul style="list-style-type: none"> Video heads may be dirty. Clean the heads with a head cleaning tape. If this fails, consult your JVC dealer.
No playback picture is available.	<ul style="list-style-type: none"> The cassette may have completed the fast-forward or rewind operation.
Noise appears in the playback picture.	
Playback picture is blurred or interrupted.	
Playback, fast-forward, or rewind impossible.	

TIME CODE GENERATOR SA-R200E (Option)

With the optional SA-R200E time code generator installed, EBU-standard LTC or VITC time code recording is possible. (LTC is recorded on the AUD-2 normal audio track.)

INSTALLATION

1. Remove the 4 screws from the side panel (controls and switches section).
2. Open the side panel as illustrated.
3. Select the lines on which VITC data is to be inserted with the rotary switches SW 1/SW 2 on the SA-R200E.

No. of switch	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Insertion line	7H	8H	9H	10H	11H	12H	13H	14H	15H	16H	17H	18H	19H	20H	21H	22H

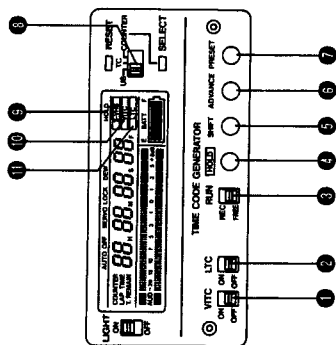
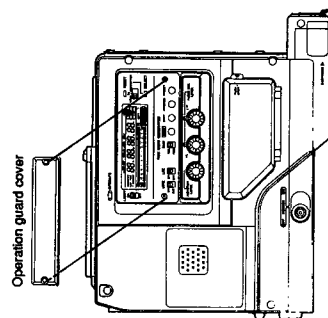
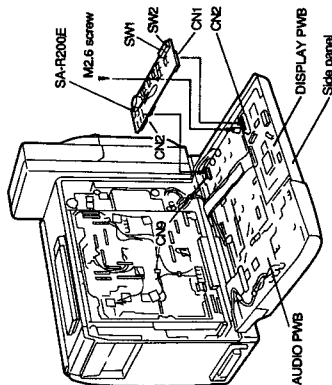
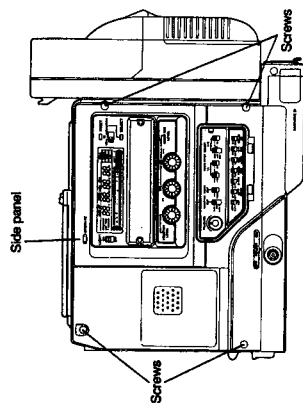
Factory preset SW 1: C (19H)
SW 2: E (21H)

NOTES:

- The BR-S422E is preset to add the AEQ (Automatic Equaliser) reference signal to line 11. Do not select line 11 for VITC insertion. If you want to delete the AEQ signal or change its insertion line, consult a JVC service centre or authorised JVC service agent.

4. Attach the SA-R200E to the recorder by connecting the CN 1 connector on the SA-R200E to the CN 2 connector on the side panel's DISPLAY PWB and the CN 2 connector on the SA-R200E to the CN 9 connector on the side panel's AUDIO PWB. Secure them with the provided M 2.6 screw as illustrated.
5. Replace the side panel and fasten the four screws.
6. Remove 2 screws and detach the operation guard cover for setting of the SA-R200E. (x7 p.27)

CONTROLS AND OPERATIONS

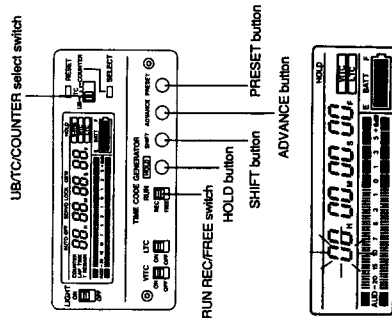


- **VITC ON/OFF switch**
ON: To record VITC time codes.
OFF: VITC time codes are not recorded.
- **LTC ON/OFF switch**
ON: To record LTC time codes. When set to this position, AUD-2 normal audio cannot be recorded.
OFF: LTC time codes are not recorded.
- **REC RUN/FREE RUN switch**
REC: The time code runs only during recording. (Rec Run mode)
FREE: The time code runs in real time, regardless of the recorder's operating mode. (Free Run mode)
- **HOLD button**
• Resets the current counter data; the leftmost digit will blink.
- **SHIFT button**
• Shifts the blinking digit to the right.
- **ADVANCE button**
• Advances the value of the blinking digit.
- **PRESET button**
• Transfers the data set with the HOLD, SHIFT, and ADVANCE buttons to the time code generator.
- **UB/TC/COUNTER select switch**
• Selects the display mode on the counter.
UB: Displays time code data.
TC: Displays time code data.
COUNTER: Displays tape counter modes selected with the SELECT button.
- **HOLD Indicator**
• Comes on when the HOLD button is pressed.
- **VITC Indicator**
• Comes on when VITC is recorded.
- **LTC Indicator**
• Comes on when LTC is recorded.

TIME CODE/USER BIT SETTING

Setting the time code

1. Set the REC RUN/FREE RUN switch as desired. (cf p.26)
2. Set the UB/TC/COUNTER select switch to "TC".



3. Press HOLD for more than 2 seconds.
 - The counter resets with the leftmost digit blinking.
4. Press ADVANCE.
 - This advances the value of the blinking digit. Set to the desired value.
5. Press SHIFT.
 - The blinking digit shifts to the right.
6. Repeat steps 4 and 5 until all data is set.
 - The maximum setting range is 23:59:59:24. Any value that exceeds this will be rejected.
7. Press PRESET.
 - The preset data will be transferred to the time code generator. The HOLD indicator goes off and the counter stops blinking.
 - In the Free Run mode, time code starts running.

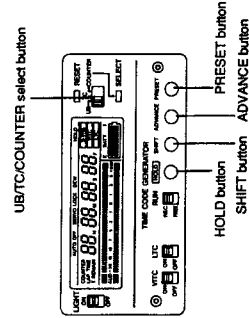
NOTES:

- The AEF switch should be set to "NORMAL" in the Rec Run mode, otherwise time code continuity will be lost at the edit point.
- If the time code has run for more than 30 minutes in the Free Run mode, it will keep running for at least 30 minutes even after the recorder's power is turned off.

Setting the user bits

"User bits" is a portion of the time code signal allocated to the user. It can be used to record the operator number or reel numbers.

1. Set the UB/TC/COUNTER select switch to "UB".



2. Press HOLD for more than 2 seconds.
 - Counter shows "00 00 00 00" with leftmost digit blinking.
 - The HOLD indicator will light.
3. Press ADVANCE to set the value of the blinking digit as desired.
 - All 8 digits can be changed from "0" to "F".
4. Press SHIFT to move the blinking digit.
5. Repeat steps 3 and 4 until all data is set.

6. Press PRESET.
 - The preset data will be transferred to the time code generator.
 - Hold indicator goes off and the counter stops blinking.
 - User bit data will not change regardless of the setting of the REC RUN/FREE RUN switch.

NOTES:

- When you want to correct the data during setting, repeat steps 3 to 6 for time code setting, 2 to 5 for user bits setting.
- If you mistakenly press the HOLD button, press it again to cancel.

SA-R200E SPECIFICATIONS

Signal system	: EBU-standard
Time set	: 8 digits (hours, minutes, seconds, frames)
User bits	: 8 digits
Power consumption	: 0.05 W
Weight	: approx. 30 g

CONNECTOR SPECIFICATIONS

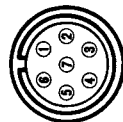
50-PIN CONNECTOR

Pin assignment



Pin No.	Signal	Pin No.	Signal	Pin No.	Signal	Pin No.	Signal
①		⑩		⑱	GND	②⑨	Signal
②		⑪		⑲		③①	Y IN
③		⑫		⑲	MIC 2 [C]	③②	GND
④		⑬		⑲	MIC 2 [H]	③③	
⑤		⑭		⑲	CAMERA POWER ON	③④	
⑥	GND	⑮	MIC GND	⑲		③⑤	
⑦	GND	⑯	MIC 1 [C]	⑲		③⑥	
⑧		⑰	MIC 1 [H]	⑲	VTR START/STOP	③⑦	
⑨		⑱	RETURN Y	⑲		③⑧	EE [H]
⑩		⑲	C IN	⑲		③⑨	+ 12 V
				⑲		③⑩	+ 12 V
				⑲		③⑪	BATT ALARM

7-PIN CONNECTOR



Pin No.	Signal
①	Y signal
②	GND (Y signal)
③	
④	
⑤	C signal
⑥	GND (C signal)
⑦	



Pin No.	Signal
①	GND
②	HOT
③	COLD

XLR 3-PIN CONNECTOR

XLR 4-PIN CONNECTOR



Pin No.	Signal
①	GND
②	
③	
④	+ 12 V

SPECIFICATIONS

GENERAL

Format : VHS/S-VHS Europe standard
 Signal system : PAL
 Power requirement : DC 12 V
 Power consumption : 13 W (Max. 38 W with camera)
 Dimensions : 287.5 (W) x 244 (H) x 131.5 (D) mm
 Weight : 3.3 kg, 4.3 kg with battery and cassette
 Temperature :
 Operating : 0°C to 40°C
 Storage : -20°C to 60°C
 Operating humidity : 30% to 80 %
 Tape width : 12.65 mm
 Recording and Play back time : 23.39 min/sec
 Play back time : 180 min. with SE-180

VIDEO

Y/C Input (50-pin camera connector)
 Y : 1.0 Vp-p, 75 ohms, unbalanced
 C : 0.3 Vp-p (burst), 75 ohms, unbalanced

Output

Composite : 1.0 Vp-p, 75 ohms, unbalanced (BNC)
 Y/C : Y: 1.0 Vp-p, 75 ohms, unbalanced
 C: 0.3 Vp-p (burst), 75 ohms, unbalanced

Signal-to-noise ratio : 45 dB

Horizontal resolution : (Fluore and Schwarz noise meter)
 More than 400 lines (S-VHS)
 More than 250 lines (VHS)

AUDIO

Number of tracks : 4 (H-Fi: 2/Normal: 2)
 Input (Switchable) :
 Line/MIC : -60 dBs, 3 k-ohms, balanced (H-Fi/Normal)
 -4 dBs, 10 k-ohms, balanced (H-Fi/Normal)

Output

Line : -6 dBs, low impedance, unbalanced (H-Fi/Normal)
 Earphone : -60 to -12 dBs, 8 ohms
 Speaker : 0.5 W, 8 ohms
 Dynamic range : More than 80 dB (H-Fi)
 Frequency response : 20 to 20,000 Hz (H-Fi)
 50 to 10,000 Hz (Normal)
 Signal-to-noise ratio : 42 dB (NR-off, Normal at 3 % distortion)
 Wow & flutter : Less than 0.007 % WRMS (H-Fi)
 Less than 0.15 % WRMS (Normal)

ACCESSORIES

Provided accessory : Carrying handle x 1

Design and specifications subject to change without notice.

SECTION 1

GENERAL DESCRIPTION AND DISASSEMBLY

Note: The numbers of screws shown on page 1-9 respectively accord with numbers of screws appearing in this section.

1.1 REMOVAL OF ENCLOSURE PARTS

Most of external covers and outer fittings of the BR-S422E are mutually fixed with other parts (for example, the front cover is fixed together with the top cover and the bottom cover). Therefore, removal of an external part needs to remove screws retaining other parts beforehand.

1.1.1 Cassette panel assy

- (1) Remove two caps and two screws ①.
- (2) Turn the power ON.
- (3) Push the EJECT button and take out the cassette panel assy.

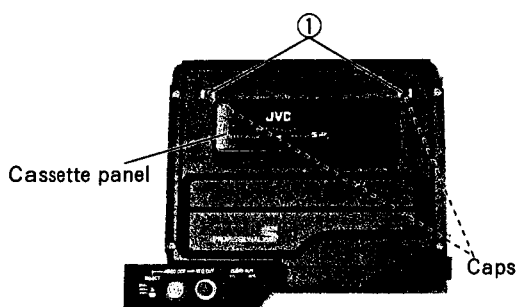


Fig. 1-1-1 Removal of Cassette panel assy

1.1.2 Left side cover

- (1) Remove the cassette panel assy (Refer to 1.1.1).
- (2) Remove four screws ② and take out the left side cover.

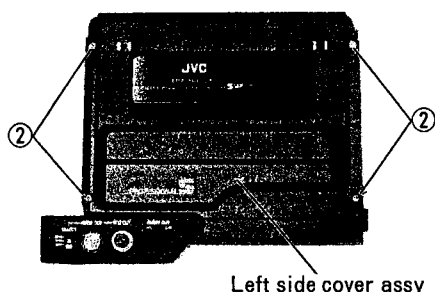


Fig. 1-1-2 Removal of Left side cover

1.1.3 Battery holder assy

- (1) Open the battery holder cover.
- (2) Remove a screw ③ and take out the battery holder cover.
- (3) Remove four screws ④ and take out the battery holder assy.

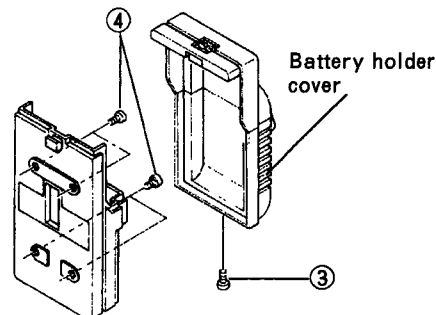


Fig. 1-1-3 Removal of Battery holder assy

1.1.4 Top cover assy

Note: Pay careful attention to wires and flat cables connected to the top cover.

- (1) Open the operation cover.
- (2) Loosen four screws ② (see Fig. 1-1-2), four screws ⑥ (see Fig. 1-1-5) and two screws ⑦ (see Fig. 1-1-6).
- (3) Remove four screws ⑤ and take out the top cover assy.

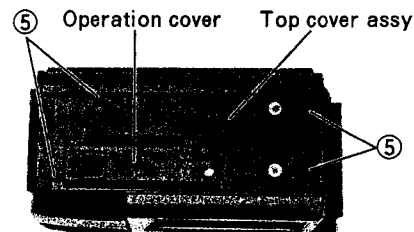


Fig. 1-1-4 Removal of Top cover assy

1.1.5 Right side cover assy

Note: Pay careful attention to wires and flat cables connected to the right side cover assy.

- (1) Remove four screws ⑥ and take out the right side cover assy.

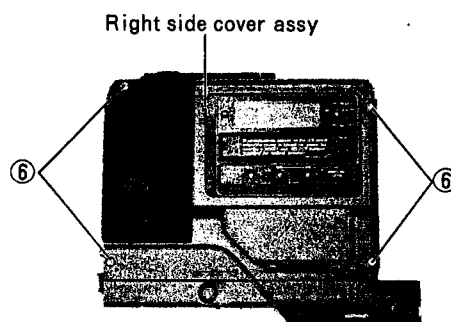


Fig. 1-1-5 Removal of Right side cover assy

1.1.6 Front cover assy

Note: Pay careful attention to wires and flat cables connected to the front cover assy.

- (1) Loosen four screws ② (see Fig. 1-1-2) and four screws ⑥ (see Fig. 1-1-5).
- (2) Remove two screws ⑦ and a screw ⑧ and take out the front cover assy.

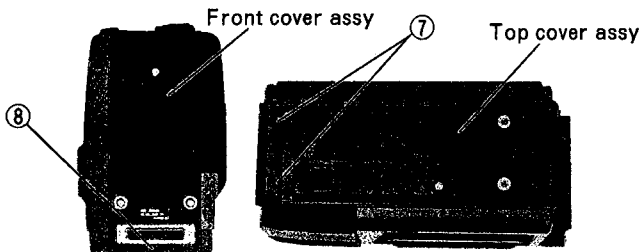


Fig. 1-1-6 Removal of Front cover assy

1.1.9 Bottom cover assy

- (1) Remove the left and right side covers (refer to 1.1.2, 1.1.5).
- (2) Remove the rear panel (refer to 1.1.7).
- (3) Remove the connector box assy (refer to 1.1.8).
- (4) Remove two screws ⑫ and two screws ⑬ take out the bottom cover assy.

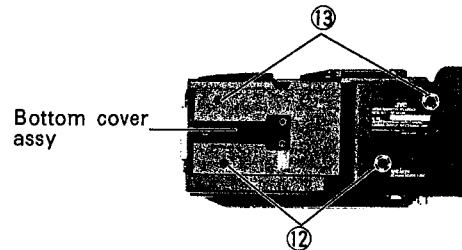


Fig. 1-1-9 Removal of Bottom cover assy

1.1.7 Rear panel

- (1) Remove two screws ② (see Fig. 1-1-2) and two screws ⑥ (see Fig. 1-1-5) (rear panel side).
- (2) Remove the connector box assy (refer to 1.1.8).
- (3) Remove four screws ⑨ and take out the rear panel.

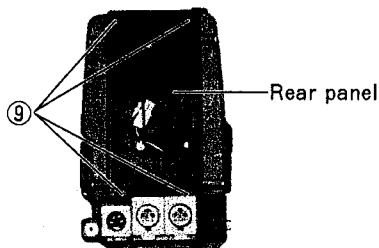


Fig. 1-1-7 Removal of Rear panel

1.1.8 Connector box assy

Note: Pay careful attention to wires and flat cables connected to the connector box assy.

- (1) Remove two screws ⑩ and two screws ⑪ and take out the connector box assy.

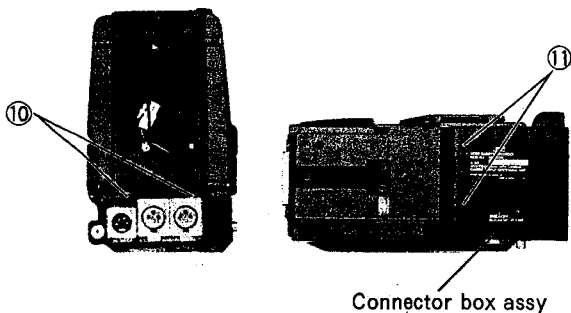


Fig. 1-1-8 Removal of Connector box assy

1.2 REMOVAL OF MAIN BOARDS

Note: Whenever intending to remove or reinstall any board, make sure to disconnect the power cord. All boards that were removed or disconnected once must be reinstalled or reconnected as they were.

Group	Board Name	Removing Procedure
A	01 VIDEO 02 C. RF 03 A. EQ 05 SYSCON/SERVO 06 REGULATOR 07 AUDIO 08 DISPLAY 11 PRE/REC JUNC	(1) Remove the right side cover assy (refer to 1.1.5). (2) Proceed to do things described in "1.2.1 Group A"
B	04 PRE/REC	(1) Remove the left side cover assy (refer to 1.1.2). (2) Proceed to do things described in "1.2.2 Group B"
C	10 MOTHER	(1) Remove the bottom cover assy (refer to 1.1.9). (2) Remove the right side cover assy (refer to 1.1.5). (3) Remove the VIDEO, the SYSCON/SERVO, the REGULATOR and the PRE/REC JUNC board. (4) Proceed to do things described in "1.2.3 Group C"
D	14 POWER CTL 15 CONNECTOR	(1) Remove the connector box assy (refer to 1.1.8). (2) Proceed to do things described in "1.2.4 Group D"
E	18 OPERATION	(1) Remove the top cover assy (refer to 1.1.4). (2) Proceed to do things described in "1.2.5 Group E"

1.2.1 Group A

- VIDEO board -

- (1) Remove two screws ⑭ and open the video board.

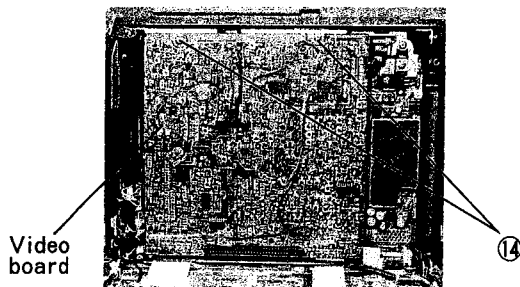


Fig. 1-2-1 Removal of Video board

- S/S board -

- (1) Open the video board.
- (2) Remove two screws ⑮ and take out the board.

- REGULATOR board -

- (1) Open the video board.
- (2) Remove a screw ⑯ and take out the board.

- PRE/REC JUNC board -

- (1) Open the video board.
- (2) Remove two screws ⑰ and take out the board.

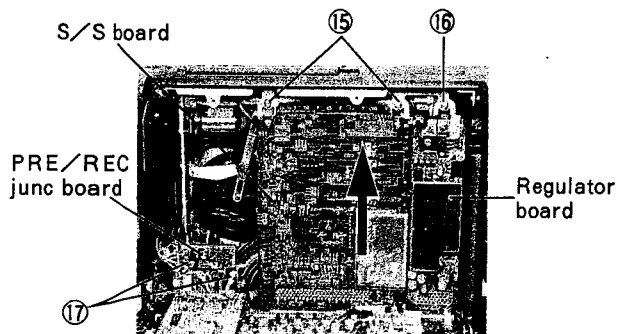


Fig. 1-2-2 Removal of S/S, Regulator, PRE/REC junc board

- AUDIO board -

- (1) Disconnect the flat wire.
- (2) Remove eight screws ⑱ and take out the board.

- DISPLAY board -

- (1) Disconnect the flat wire.
- (2) Remove four screws ⑳ and take out the board.

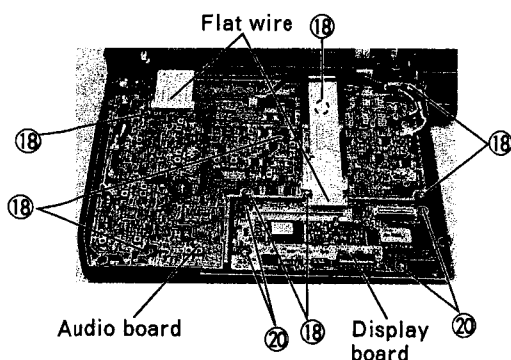


Fig. 1-2-3 Removal of Audio and Display board

1.2.2 Group B

- PRE/REC board -

- (1) Disconnect the flat wire.
- (2) Remove two screws ㉑ and take out the board.

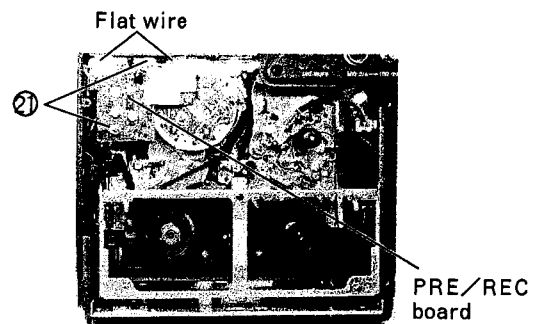


Fig. 1-2-4 Removal of PRE/REC board

1.2.3 Group C

- MOTHER board -

- (1) Disconnect the flat wire (refer to Fig. 1-2-3).
- (2) Remove a screw ㉒ and take out the Mecha JUNC board.
- (3) Remove four screws ㉓ and take out the frame from the main-deck.
- (4) Remove five screws ㉔ and take out the board.

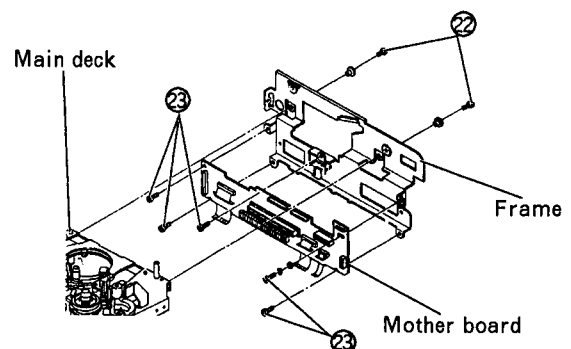
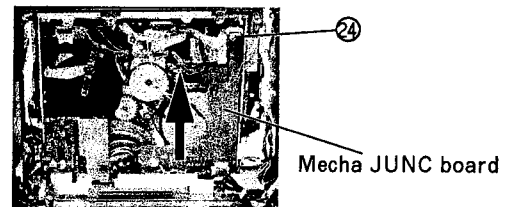


Fig. 1-2-5 Removal of Mother board

1.2.4 Group D

- POWER CTL board -

- (1) Remove three screws ㉕ and take out the board.

- CONNECTOR board -

- (1) Unolder the BNC and the Y/C connector.
- (2) Remove three screws ㉖ and take out the board.

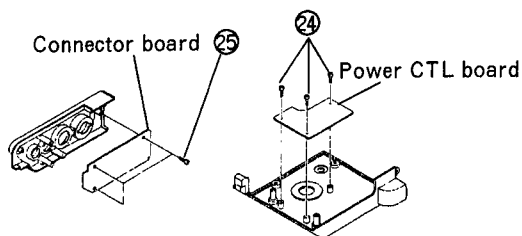


Fig. 1-2-6 Removal of Power CTL and Connector board

1.3 REMOVAL OF CASSETTE HOUSING

- (1) Remove the left side cover assy (refer to 1.1.2).
- (2) Remove the top cover assy (refer to 1.1.4).
- (3) Remove the right side cover assy (refer to 1.1.5).
- (4) Remove the front cover assy (refer to 1.1.6).
- (5) Remove the rear panel (refere to 1.1.7).
- (6) Remove five screws ⑭ securing the video, the syscon/servo and the regulator boards (refer to 1.2.1) and remove two screws ⑲ then take out the top frame..
- (7) Remove four screws ⑳.
- (8) Set the cassette housing to the "EJECT" condition.
- (9) Pull the whole of the cassette housing frontwards while release its foot from the hole of the main deck one by one.

1.2.5 GROUP E

- OPERATION board -

- (1) Remove two screws ⑳ and take out the holder assy.
- (2) Remove four screws ㉑ and take out the board.

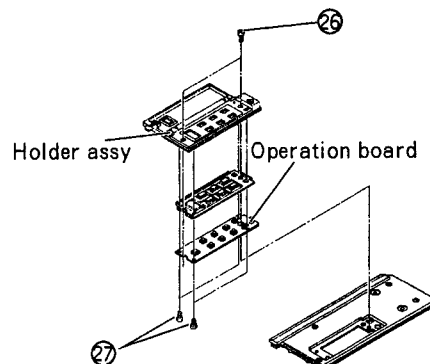


Fig. 1-2-7 Removal of Operation board

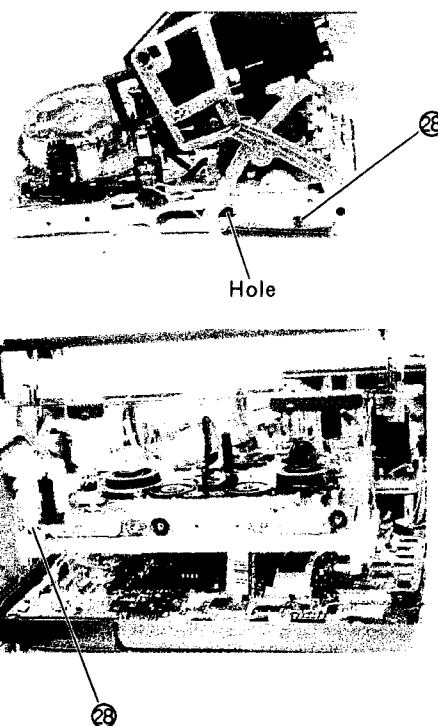
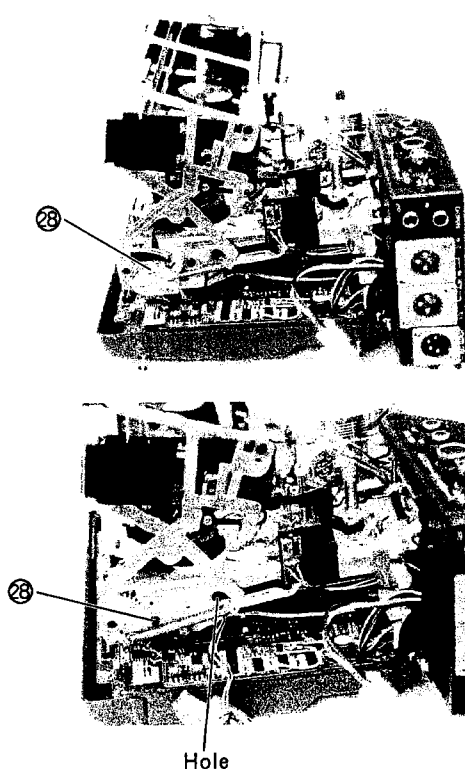
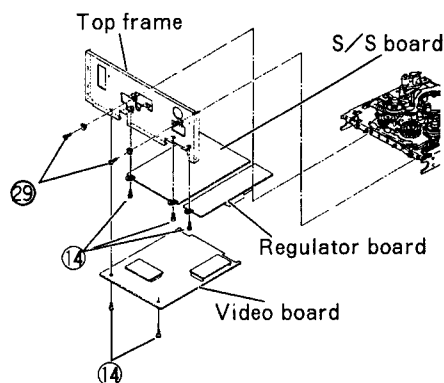
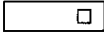


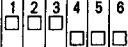
Fig. 1-3-1 Removal of Cassette housing

1.4 INTERNAL SWITCHES


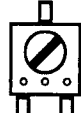

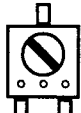

1.4.1 01 VIDEO board

Symbol No.	Switch Name	Initial Setting	Function
SW1	Detail switch	ON ↔ OFF  SW1	ON: 2MHz signal is raised up by 1.5 to 2.0 dB to emphasize detail in VHS mode. OFF: Normal operation.

1.4.2 03 AUTO EQ board

Symbol No.	Switch Name	Initial Setting	Function																																				
SW1-1	Power switch for AUTO EQ (Always ON setting)	SW1 ON 	Usually set to ON position.																																				
1-2 1-3 1-4	AUTO EQ line select switch		In the S-VHS mode, select a reference signal addition line for AUTO EQ circuit with SW1-2, SW1-3 and SW1-4. <table border="1"> <thead> <tr> <th>SW1-2</th><th>SW1-3</th><th>SW1-4</th><th>LINE No.</th></tr> </thead> <tbody> <tr> <td>ON</td><td>ON</td><td>ON</td><td>NON-ADDITION</td></tr> <tr> <td>ON</td><td>ON</td><td>OFF</td><td>11H</td></tr> <tr> <td>ON</td><td>OFF</td><td>ON</td><td>12H</td></tr> <tr> <td>ON</td><td>OFF</td><td>OFF</td><td>13H</td></tr> <tr> <td>OFF</td><td>ON</td><td>ON</td><td>14H</td></tr> <tr> <td>OFF</td><td>ON</td><td>OFF</td><td>15H</td></tr> <tr> <td>OFF</td><td>OFF</td><td>ON</td><td>16H</td></tr> <tr> <td>OFF</td><td>OFF</td><td>OFF</td><td>17H</td></tr> </tbody> </table>	SW1-2	SW1-3	SW1-4	LINE No.	ON	ON	ON	NON-ADDITION	ON	ON	OFF	11H	ON	OFF	ON	12H	ON	OFF	OFF	13H	OFF	ON	ON	14H	OFF	ON	OFF	15H	OFF	OFF	ON	16H	OFF	OFF	OFF	17H
SW1-2	SW1-3	SW1-4	LINE No.																																				
ON	ON	ON	NON-ADDITION																																				
ON	ON	OFF	11H																																				
ON	OFF	ON	12H																																				
ON	OFF	OFF	13H																																				
OFF	ON	ON	14H																																				
OFF	ON	OFF	15H																																				
OFF	OFF	ON	16H																																				
OFF	OFF	OFF	17H																																				
1-5 1-6	Not used																																						

1.4.3 07 AUDIO board

Symbol No.	Switch Name	Initial Setting	Function
SW 21 (CH1) 22 (CH2)	MIC AMP GAIN setting switch	OFF 	To adjust sensitivity of LINE IN (−60dB) MIC AMP by 10dB up and down. <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  Initial setting LINE IN −60dB </div> <div style="text-align: center;">  10dB down LINE IN −50dB </div> <div style="text-align: center;">  10dB up LINE IN −70dB </div> </div>
SW 23	NORMAL AUDIO LIMITER switch	ON OFF ↔ ON  SW23	ON: Limiter circuit is activated with +6dB of standard. OFF: Limiter circuit is inactivated.

1.4.4 08 DISPLAY board

Symbol No.	Switch Name	Initial Setting	Function
SW3-1	BM switch	<div>SW3<div>ON<div><div><div>1</div><div>2</div><div>3</div><div>4</div><div>5</div><div>6</div><div>7</div><div>8</div></div><div><div><div><div></div></div><div><div></div></div><div><div></div></div><div><div></div></div><div><div></div></div><div><div></div></div><div><div></div></div><div><div></div></div></div></div></div></div></div>	<div>ON : LTC's bi-phase mark phase correction circuit is activated.</div> <div>OFF : LTC's bi-phase mark phase correction circuit is inactivated.</div>
3-2	Not used		—
3-3	AEF (Auto Editing Function) switch (having priority over others)		<div>ON : AEF is inactivated (without back-space and picture dropout).</div> <div>OFF : Normal operation (to be operated by the AEF switch on the side panel).</div>
3-4	EEP ROM clear ON/OFF switch		<div>ON : EEP ROM CLEAR circuit is activated.</div> <div>OFF : EEP ROM CLEAR circuit is inactivated.</div>
3-5	ZERO FRAME EDITING switch		<div>ON : ZFE is inactivated. (Recording slightly overlaps at editing point at which time code is partially erased.)</div> <div>OFF : Normal operation.</div>
3-6	DEW warning cancel ON/OFF switch		<div>ON : DEW warning is forcibly canceled and recording is enabled. (DEW warning appears in the display.) Monitor speaker's alarm sound is cut off.</div> <div>OFF : Normal operation.</div>
3-7	Not used		—
3-8	Not used		—

1.4.5 09 TIME CODE board (SA-R200E : Optional)

Symbol No.	Switch Name	Initial Setting	Function																																				
SW1 SW2	VITC insertion line select switch	SW1 : C(19H) SW2 : E(21H)	VITC insertion lines are individually settable. <table><tr><td>SW No.</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr><tr><td>Insertion line</td><td>7H</td><td>8H</td><td>9H</td><td>10H</td><td>11H</td><td>12H</td><td>13H</td><td>14H</td></tr><tr><td>SW No.</td><td>8</td><td>9</td><td>A</td><td>B</td><td>C</td><td>D</td><td>E</td><td>F</td></tr><tr><td>Insertion line</td><td>15H</td><td>16H</td><td>17H</td><td>18H</td><td>19H</td><td>20H</td><td>21H</td><td>22H</td></tr></table>	SW No.	0	1	2	3	4	5	6	7	Insertion line	7H	8H	9H	10H	11H	12H	13H	14H	SW No.	8	9	A	B	C	D	E	F	Insertion line	15H	16H	17H	18H	19H	20H	21H	22H
SW No.	0	1	2	3	4	5	6	7																															
Insertion line	7H	8H	9H	10H	11H	12H	13H	14H																															
SW No.	8	9	A	B	C	D	E	F																															
Insertion line	15H	16H	17H	18H	19H	20H	21H	22H																															

1.5 HOUR METER DISPLAY

This model is equipped with an hour meter of internal memory storage type (used for EEP-ROM). The counter display can also show the total drum rotating hours.

- (1) EJECT the cassette tape.
- (2) Close the cassette cover.
- (3) Press REC and SELECT buttons for more than 3 seconds.
•Counter shows total drum rotating hours.
- (4) Press STOP button to return to the normal counter.

1.5.1 How to reset the hour meter

- (1) EJECT the cassette tape.
- (2) Close the cassette cover.
- (3) Set the DIP switch 3-4 on the 08 DISPLAY board to ON position.
- (4) Press SELECT button for more than 3 seconds.
- (5) Display the "EEP cLEA" on the counter display then the hour meter is rested.
- (6) Change the DIP switch to OFF position.

1.6 BATTERY CONNECTOR

Battery connector assy : Part No. PGJ05027

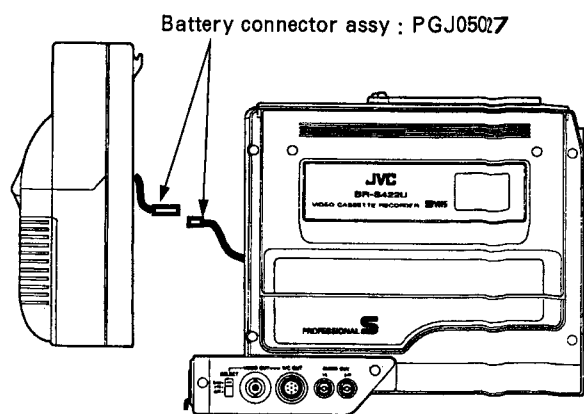


Fig. 1-6-1 Battery connector assy

1.7 EMERGENCY EJECT

When the VTR enters the AUTO OFF state and the cassette tape cannot be ejected, take out the cassette tape according to the following procedure.

- (1) Turn the power off of the VTR.
- (2) Remove the cassette panel so that the tape is exposed (see 1.1.1, page 1-1).
- (3) Remove the right side cover Assy (see 1.1.5, page 1-1).
- (4) Remove the VIDEO board and the S/S board (see 1.2.1, page 1-4).
- (5) Turn the pulley of the loading motor installed on the back side of the main deck with a screwdriver or the like toward the arrow direction.
- (6) If the tape comes loose, turn the pulley of the clutch mechanism to wind the tape for pulling in the slack of the tape.
- (7) Repeat the above steps (5) and (6) until the tape is restored in the STOP mode.
- (8) In the STOP mode, slide the lock plate or the lock plate's pin that is locking the cassette housing in the arrow direction to eject the cassette tape.

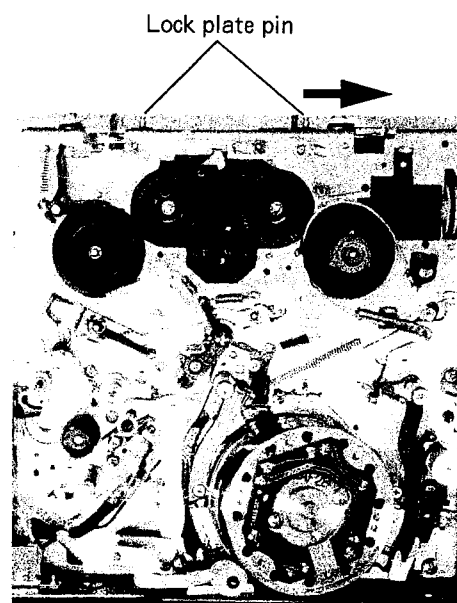
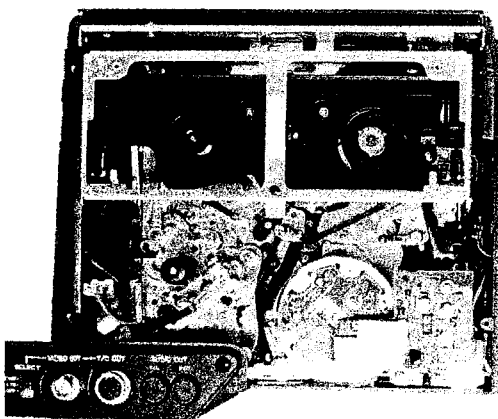
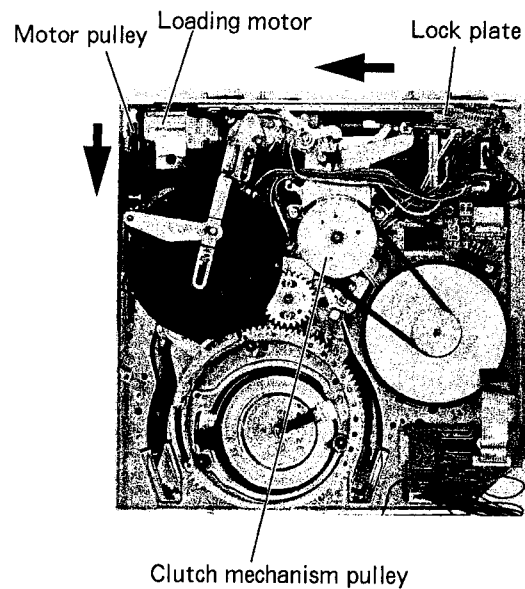
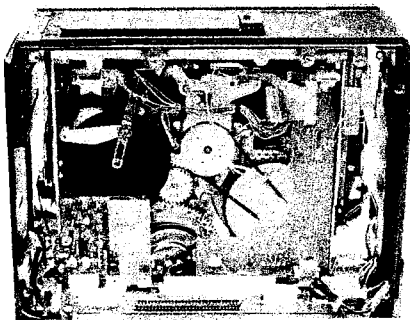
















Fig. 1-7-1 Emergency eject

TABLE OF SCREWS USED IN THIS SET

Note: The numbers of screws shown below respectively accord with numbers of screws appearing in this section.

<p>① (black)</p>  <p>SDSP2606M</p>	<p>②,⑥ (silver)</p>  <p>SC43397-010 (M3)</p>	<p>③ (black)</p>  <p>SDSP3005M</p>	<p>④,⑤,⑧,⑨,⑩,⑫</p>  <p>SDSP3008M (black)</p>	<p>⑦ (black)</p>  <p>SDSP4008M</p>
<p>⑪,⑬ (black)</p>  <p>SDSP3014M</p>	<p>⑭,⑮,⑯ (gold)</p>  <p>PRD44050-02 (M2.6)</p>	<p>⑰,⑱,㉑,㉒,㉓ (gold)</p>  <p>SDSP2606Z</p>	<p>⑲ (gold)</p>  <p>YQM30032-49 (M2..6)</p>	<p>㉔,㉕ (gold)</p>  <p>PRD30093 (M2.6)</p>
<p>㉖ (gold)</p>  <p>SDST2605Z</p>	<p>㉗ (black)</p>  <p>SDSP2006M</p>	<p>㉘ (gold)</p>  <p>SDSF2004Z</p>	<p>㉙ (gold)</p>  <p>SDST2606Z</p>	

SECTION 2 MECHANISM ADJUSTMENT

Note: The numbers of screws and slit washers shown back of this section respectively accord with numbers of them appearing in this section.

2.1 PREPARATION

2.1.1 Precautions

- (1) When using a soldering iron, disconnect the power cord after heating it.
- (2) When disconnecting connectors, do not pull connector cables by a strong force.
- (3) Do not disturb adjusting parts such as screws thoughtlessly as there is a trouble of unknown reason.

2.1.2 Jigs and special tools for mechanism adjustment

For mechanism adjustment, the following jigs and special tools are required.

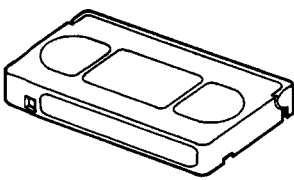
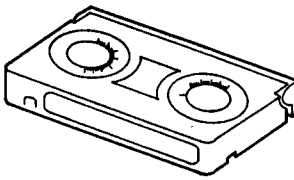
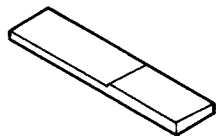
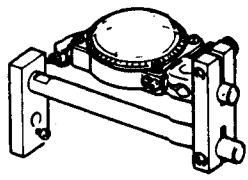
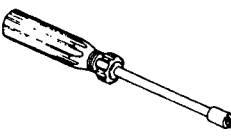
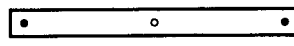
Alignment tapes MHPE, MBAE-3, MBPE-X, MH-F8	Cassette torque meter PUJ42881	Parallel check plate PUJ50204(0.1mm)/PGJ04039(0.15mm)	Microchecker PUJ49712-2
			
Taper nut driver PUJ50637	Microchecker attachment PGJ04006	<ul style="list-style-type: none"> • General tools required besides above special tools • Nut-driver (7 mm) • Hex. key (0.9 mm, 1.27 mm) • Ordinary (+) screwdrivers [PGJ04037(3 mm), PGJ04038(2.6 mm)] 	
			

Table 2-1-1 Jigs and special tools

2.1.3 Specifications of alignment tapes

• MHPE

Video signal	Audio signal	Application	Remark
VHS SP mode Stairstep	6kHz	<ul style="list-style-type: none"> • For check adjustment of interchangeability. • For adjustment of PB switching point. 	MH-2 stairstep signal substitutable.

• MBAE-3

Video signal	Audio signal	Application	Remark
—	1kHz (Guard band recording)	For rough adjustment of stereo A/C head height.	Only MBAE-3 part name changed.

• MBPE-X

Video signal	Audio signal	Application	Remark
Stairstep (1 field no-recording every 5 frames.)	6kHz	For rough adjustment of X-value.	Only MHPE-X part name changed.

• MH-F8

No.	PB time	Video signal	Audio signal	Application
1	5 minutes	—	Carrier only	Check and adjustment of interchangeability of mechanism.
2	5 minutes	Stairstep	Carrier only	Check and adjustment of interchangeability of mechanism.
3	5 minutes	—	1kHz (±50kHz DEV)	Check and adjustment of FM audio PB circuit.

2.2 PERIODIC REPLACEMENT OF MAIN PARTS

Periodic inspection and maintenance are needed in order to ensure performance and reliability. The following table has been compiled simply to give a general idea regarding maintenance and inspection.

In practice, the periods indicated will vary widely according to environmental and usage conditions. Also be aware that rubber parts may deform and age even when the equipment is not used.

	No. *1	Part Name	Part No.	Standard service period *2										Ref. section	Remarks
				500	1000	1500	2000	2500	3000	3500	4000	4500	5000		
Tape transport system	①	Tension pole assy	PRD43771A-03											—	
	②	Impedance roller	PRD44135-01-01											—	
	③	SP. pole base assy	YQ40653B											—	
	④	TU. pole base assy	YQ40509D	★	★	★	★	★	★	★	★	★	★	—	
	⑤	TU. guide pole Lower flange	PRD44733 PRD44094											—	
	⑥	Capstan shaft	—											—	
	⑦	Guide arm assy	PQ40993B											—	
	⑧	Full erase head assy	PRD43795A-01	★	★	★	★	★	★	★	●	★	★	2.3.8	
	⑨	A/C head	PGZ01675	★	★	★	★	★	★	★	●	★	★	2.3.7	Excluding A/C head board
	⑩	Pinch roller	PQ41125A	★	★	★	●	★	★	★	●	★	★	2.3.5	
	⑪	Drum assy	PDV2308A	★	★	★	★	★	○/★	★	●	★	★	2.3.9	
	⑫	Upper drum assy	PRD20443D	★	★	★	●	★	★	★	↑	★	★	2.3.1 / 2.3.2	Included in Drum assy
Driving system	⑬	Capstan motor	PGZ01728-01-01								●			2.3.11	
	⑭	Reel belt	PQM30003-12				○				●			2.3.11	
	⑮	Loading motor	PGZ01939								●			2.3.10	
	⑯	Loading belt	PRD30022-19				○				●			2.3.10	
	⑰	SP. reel disk	PGZ01341				△				○/△			2.3.13	
	⑱	TU. reel disk	PGZ01342				△				○/△			2.3.14	
	⑲	Search brake assy	PQ40858B								●			2.3.6	
	㉔	REW brake assy	PQ40860B-3								●			2.3.6	
	㉕	FF brake assy	PRD44028A								●			2.3.6	
	㉖	SP. clutch	YU40427								○			2.3.13	*3
	㉗	TU. clutch	PU56650-1-4								○			2.3.14	*3
Others	㉘	Brush assy	YU40548-1-1				●				●			2.3.12	
	㉙	Tension band assy	PQ40851B				●				●			2.3.4 / 2.5.1	*4
	㉚	Head cleaner	PQ44837		●		●		●		●		●	2.3.3	Not included in Drum assy

*1 Symbol numbers correspond to numbers in Fig. 2-2-1.

*2 Know the standard service period by hour meter.

*3 Check torque at every servicing.

*4 Check back tension at every servicing.

★=Cleaning.

○=Check and Replace if necessary, or
Check and Clean.

●=Replacement.

↑=Same as above.

△=Oiling.

2.2.1 Location of main parts

Note: Symbol numbers correspond to numbers in the table on page 2-2.

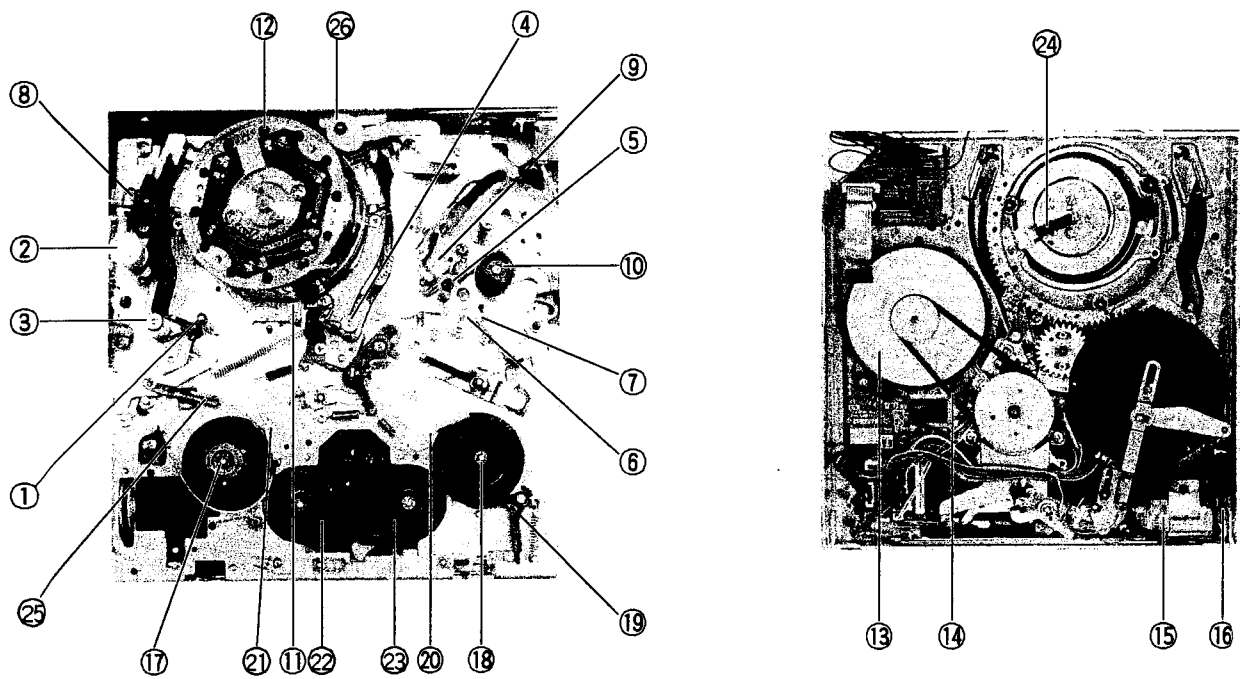


Fig. 2-2-1

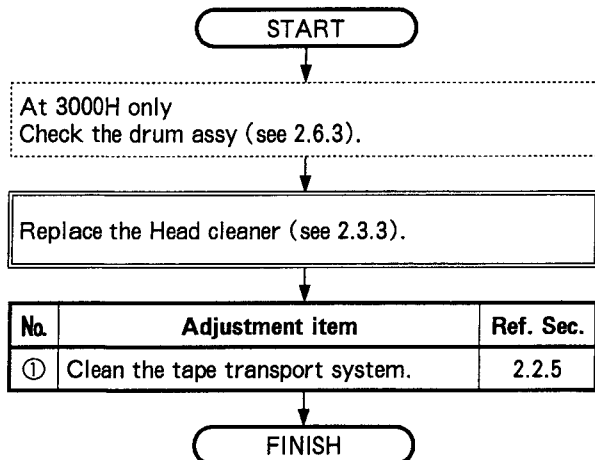
2.2.2 Maintenance step of main parts

Check, and replace
if necessary.

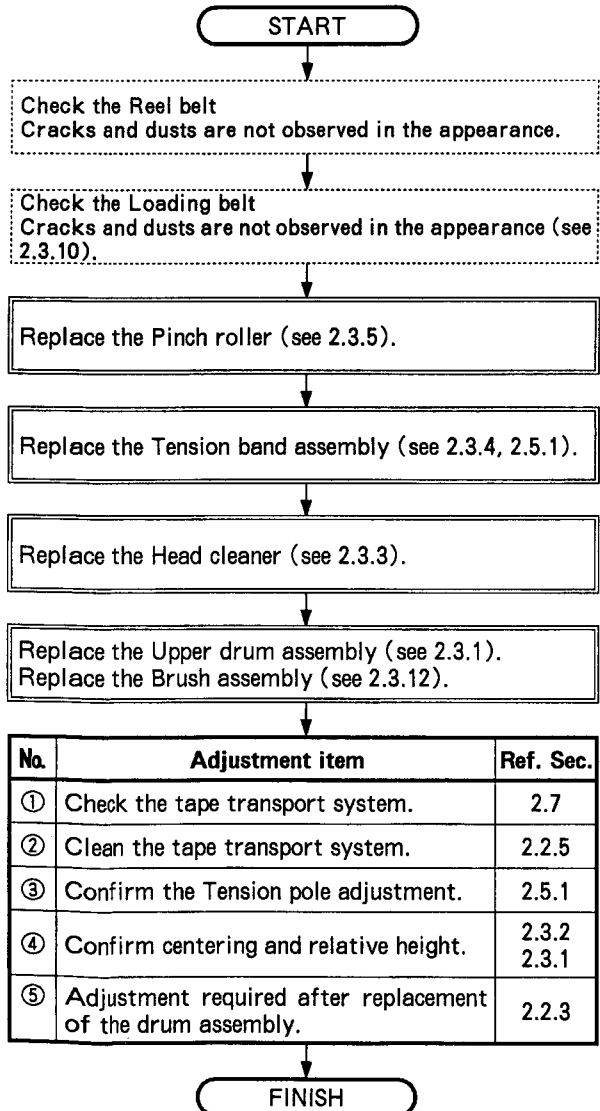
Replace.

Adjustment after
replacement.

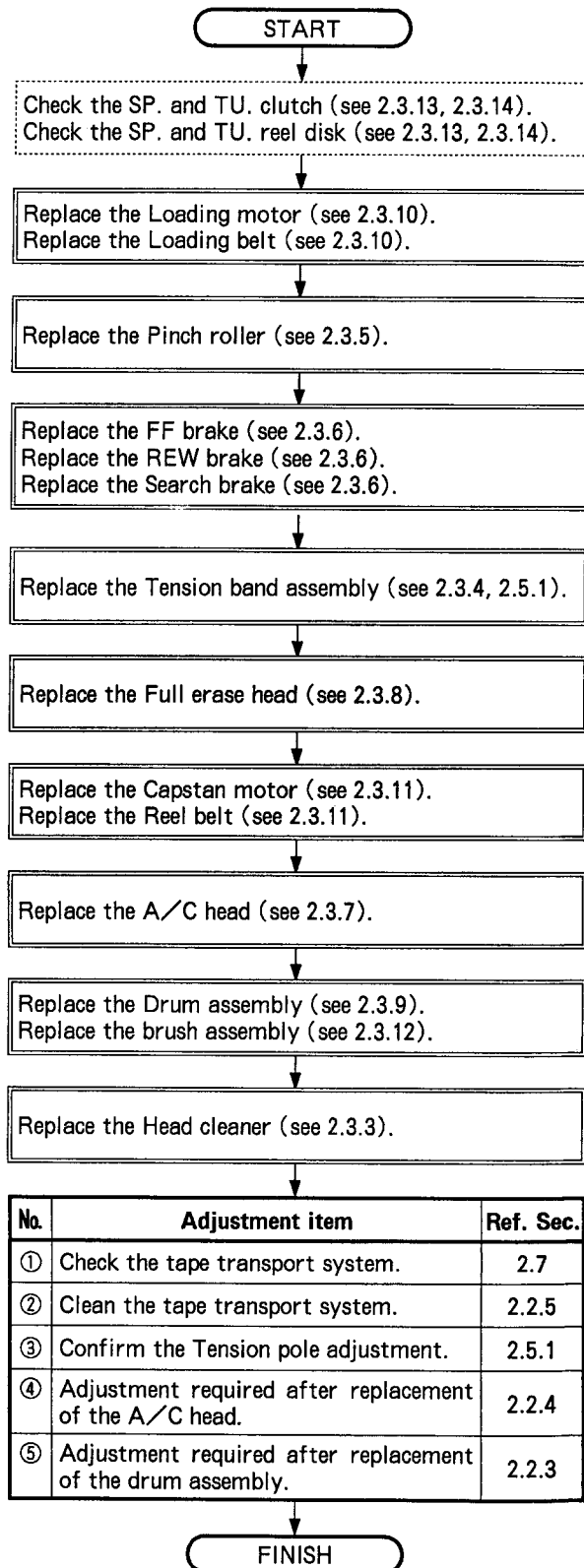
1. 1000H, 3000H and 5000H maintenance



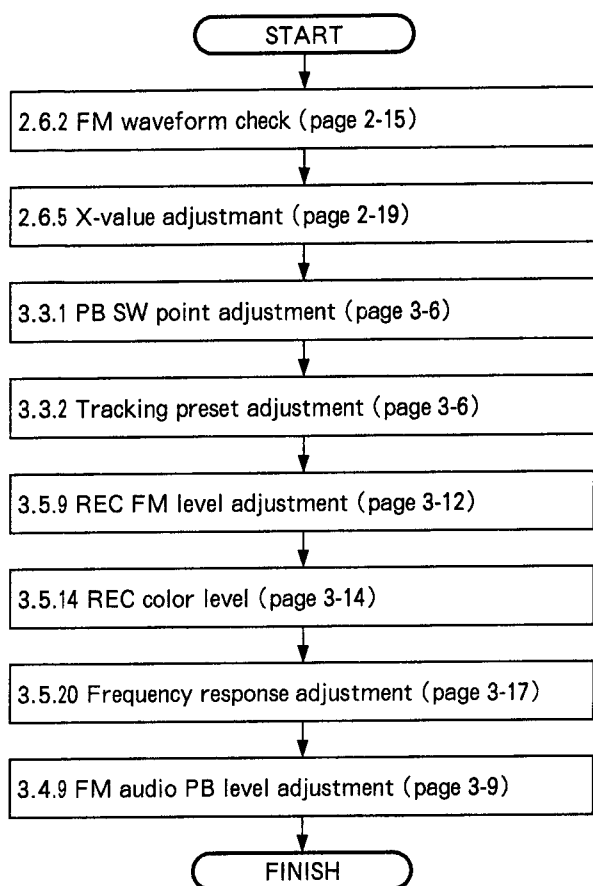
2. 2000H maintenance



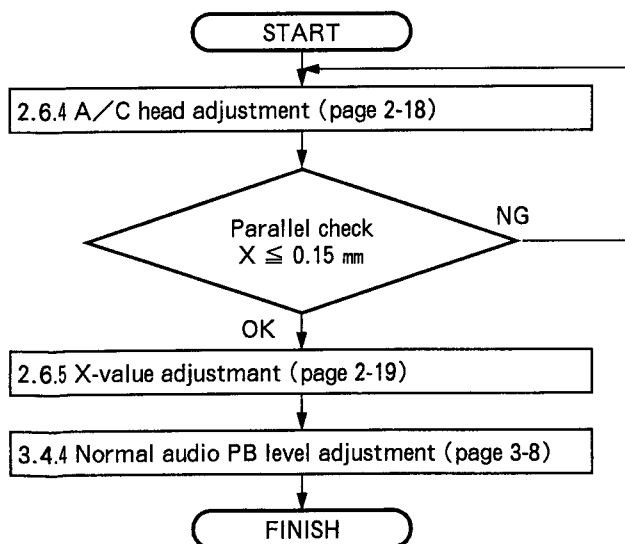
3. 4000H maintenance



2.2.3 Adjustments required after replacement of drum assembly



2.2.4 Adjustments required after replacement of A/C head



2.2.5 Cleaning

Although periodical cleaning of parts of the tape transport system is desirable, it is almost impossible to put it into practice. Therefore, it is strongly recommended to clean the tape transport system when a set is brought in to undergo repair and check. For cleaning use fine woven cotton cloth moistened with ethyl alcohol.

(1) Video heads

Dirty video heads get playback picture rough and invisible in the extreme case.

For cleaning the video head, lightly press quality paper moistened with ethyl alcohol to the upper drum by finger while turning the upper drum.

Note: Since the video head is weak against vertical force (applied in the up-down direction), moving of cleaning paper may possibly damage the video head.

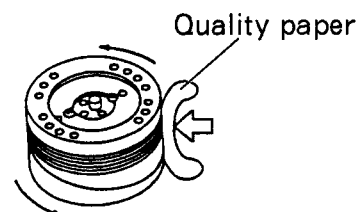


Fig. 2-2-2 Cleaning of Upper drum

(2) Tape guides

Dirty tape guides not only increase video heads in getting dirty much more but also cause damage to tape.

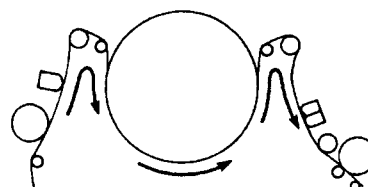


Fig. 2-2-3 Tape guides

(3) Brush

Dirty and dusty brush causes horizontal snow noise in playback picture.

(4) A/C head and FE head

For cleaning them, scrub the head with an applicator moistened with ethyl alcohol.

2.2.6 Oiling and greasing

If oil or grease on the other party is old and dirty, wipe it off and apply new oil or grease to it, too.

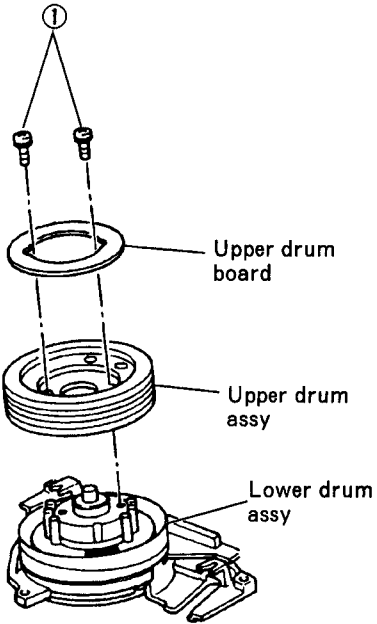
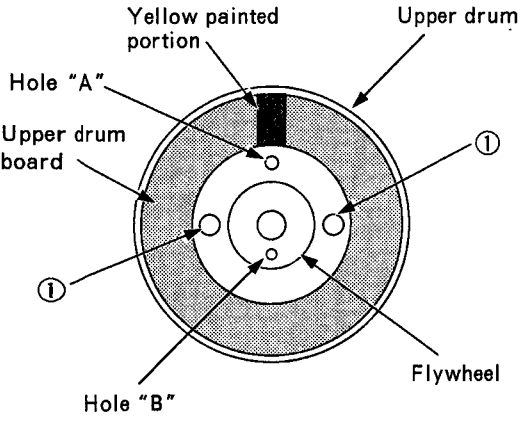
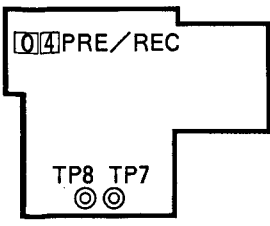
(1) Oil and grease used for this set are as follows.

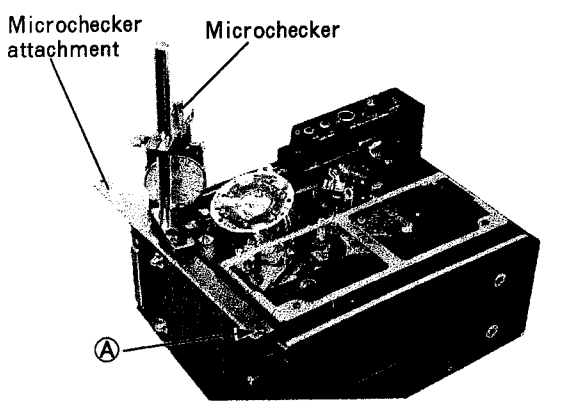
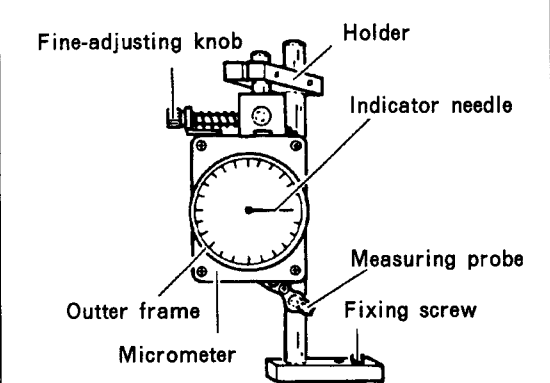
Item	Name	JVC Part No.
Oil	Cosmo Hydro HV56	COSMO-HV56
	<General spindle oil (low viscosity) is substitutable>	
Grease	Moriton Grease (black)	MOS2-C
	Floil (light brown)	KANTO-GB-TS-1
	Beacon-325 (cream)	PGJ04040

(2) Apply grease every 4000 hours of operation or taking an opportunity of parts replacement.

2.3 REPLACEMENT OF MAIN PARTS

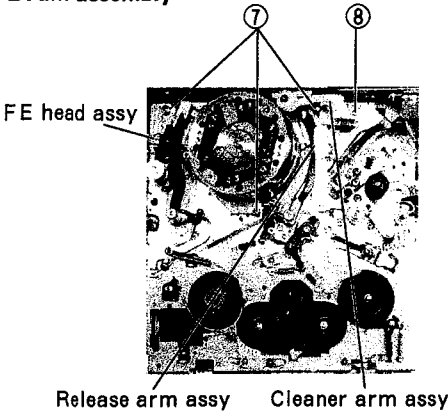
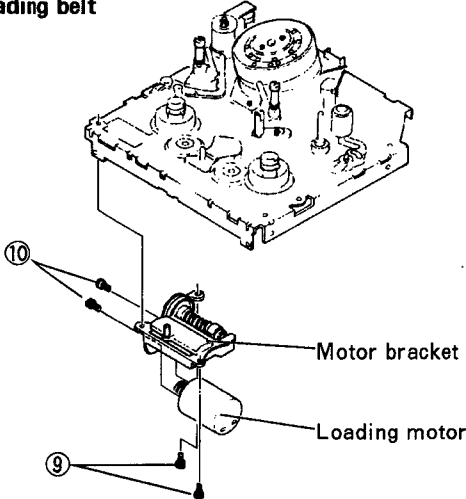
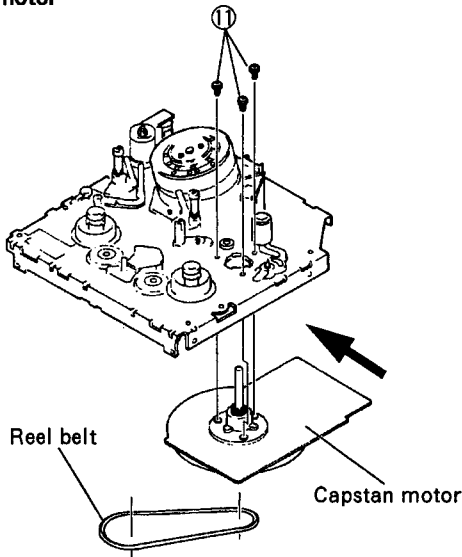
Note: For parts replacement, take out the cassette panel assy (see 1.1.1, page 1-1) and the left side cover assy (see 1.1.2, page 1-1).

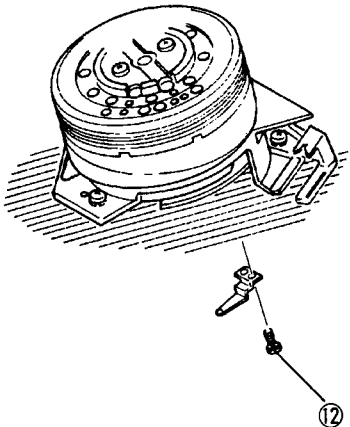
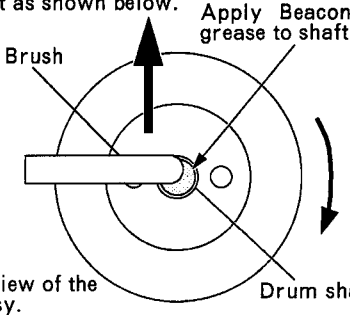
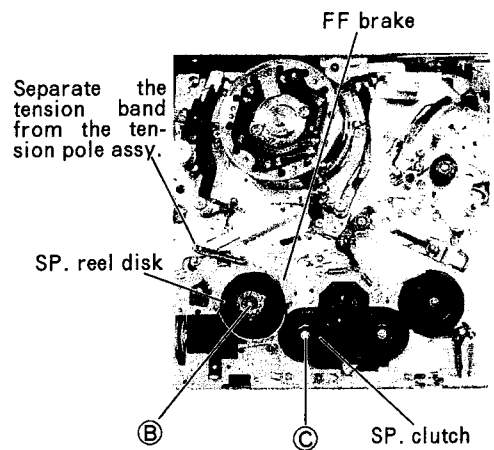
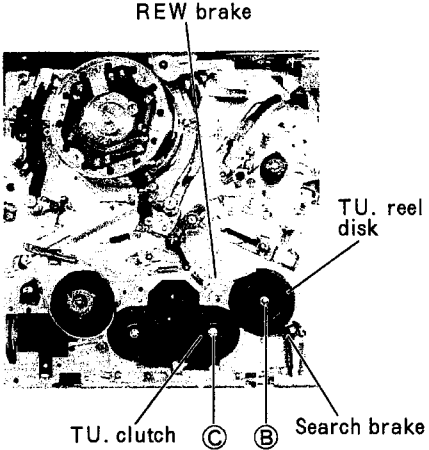
No.	Item	Adjustment and Check
1	<p>Upper drum assembly</p> <p>— Removal —</p>  <p>Fig. 2-3-1 Removal of Upper drum</p>	<p>Note:</p> <ul style="list-style-type: none"> • When re-installing the upper drum assembly, put it right down on the lower drum assembly with care not to touch the heads. • For cleaning the heads, press quality paper moistened with alcohol to the drum head with fingers while turning the upper drum assembly counterclockwise. At that time, do not move cleaning paper nor the upper drum vertically to each other. <ol style="list-style-type: none"> (1) Set the cassette housing to the EJECT condition while remove the cassette panel and the left side cover assembly (see 1.1.1 and 1.1.2, page 1-1). (2) Remove the PRE/REC board assy (see 1.2.2, page 1-4). (3) Unsolder the relay pin terminal of the Upper drum board and remove the board. (4) Remove two screws ① and lift the upper drum upwards to detach it.
	<p>— Reinstallation —</p>  <p>Fig. 2-3-2 Reinstallation of Upper drum and board</p>	<p>Note: Proceed to the following reassembling very carefully not to touch and damage the drum head.</p> <ol style="list-style-type: none"> (5) Clean the contact surfaces of the upper drum assembly and the lower drum assembly with alcohol. Note: Dusty contact surface causes maladjustment of the relative height of the heads. If the relative height of the heads is incorrect, the maximum levels of the CH-1 and CH-2 FM waveforms are observed different from each other when vary with the tracking control. (6) Install the upper drum assembly so that the hole "A" of the upper drum assembly and the hole "B" of the flywheel are positioned to each other at an angle of 180°. (7) Tighten two screws ① evenly. (8) Check right centering of the upper drum (see 2.3.2, page 2-7) (9) Put the UPPER DRUM board on the upper drum assembly so that the yellow painted portion of the board and the hole "B" of the flywheel are positioned to each other at an angle of 180° and solder the board. (10) Clean the drum assembly on the whole (particularly the upper drum). (See 2.2.5, page 2-5.)
	<p>— Check and Adjustment —</p> <p>— Location of TPs —</p> 	<ol style="list-style-type: none"> (1) Check the relative height according to the following procedure. <ol style="list-style-type: none"> ① Set the alignment tape MHPE and connect an oscilloscope's probe with TP7 on ④ PRE/REC board while connecting its other probe with TP8 on ④ PRE/REC board for external trigger. ② Adjust the tracking control to confirm that waveforms of CH-1 and CH-2 simultaneously become maximum. ③ When they extremely differ from each other in the level or time, remove the upper drum to clean its bottom surface and the upper surface of the lower drum's flywheel. repeat the above steps reinstallation. (12) Perform the adjustments required after replacement of the drum assembly as described in 2.2.3, page 2-5.

No.	Item	Adjustment and Check
2	<p>Centering of upper drum</p> <p>If the upper drum is so installed as its center is off the center of the drum shaft, it causes jitters and other troubles. This matter (item) generally not check, however, when jitter remarkably appears in the picture, check neither wobbling in the upper drum rotation nor eccentricity of its shaft.</p> <div>  </div> <p>Fig. 2-3-3 Position of Microchecker installation</p> <div> <p>Cautions to handle microchecker</p> <ol style="list-style-type: none"> ① Keep the microchecker out of any shock or vibration since it is high precision instrument. ② Do not apply unnecessary force to the probe. ③ Although the outer ring of the micrometer is turnable approximately in a range of ± 10 graduations, do not turn it with strong force (more than 300g-cm). ④ Be careful not to touch the probe with video heads directly. ⑤ When setting the microchecker, make sure that the probe always orientates the center of the drum for working. ⑥ If rubbing or grating sound occurs in measuring, it results from abnormal contact of the probe. In such a case, check the upper drum and the tip of the probe whether dust or other contamination is on them, or not. </div> <div>  </div> <p>Fig. 2-3-4 Microchecker : PUJ49712-2</p>	<ol style="list-style-type: none"> (1) Required tool: <ul style="list-style-type: none"> •Screw:SDSP3006Z •Microchecker:PUJ49712-2 •Microchecker attachment:PGJ04006 (2) Set the microchecker attachment on the panel by the portion ① with a SDSP3006Z screw. For this mounting, insert plain washers (about 2.5mm thick) under portion ①. (3) Carefully set the micrometer not to knock it against the upper drum. (4) Slowly turn the micrometer's fine-adjusting knob clockwise until the indicator reads "0". The outer ring is usable for this adjustment in a range of ± 10 graduations at maximum. Do not turn it further than this range. (5) Being very careful not to apply any lateral pressure to the upper drum, turn it gently (with a paper string, for example). At that time, it is a minimum requirement that the pointer shakes in a range of ± 1.5 micron. (6) If the pointer shakes more than ± 1.5 micron, turn the micrometer's fine-adjusting knob counterclockwise to release the probe from contact. Loosen two screws retaining the upper drum while fine adjusting the setting position of the upper drum, then tighten the screws again. (7) Again check deflection in the center of the upper drum and adjust the centering until the micrometer's pointer just shakes in a range of ± 1.5 micron. (8) Turn the microchecker's fine-adjusting knob counterclockwise, then remove it.

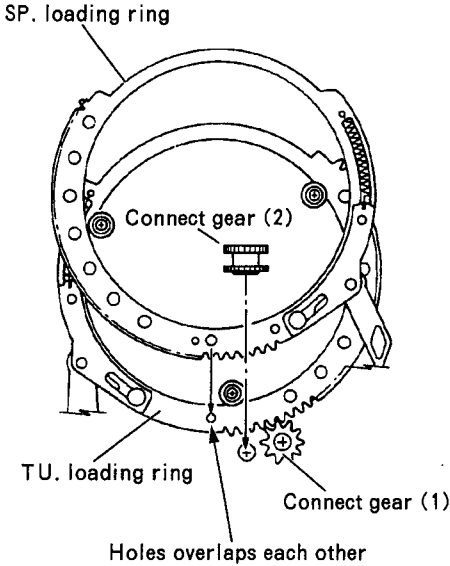
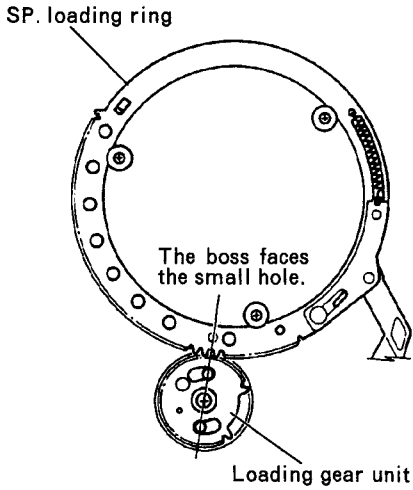
No.	Item	Adjustment and Check
3	Head cleaner <div> <p>Pull up the sponge upwards.</p> <p>Cleaner</p> </div> <p>Fig. 2-3-5 Removal of Head cleaner</p>	<p>(1) Pull up the cleaner (sponge) a little while taking it out.</p> <p>(2) Replace it with a new cleaner in the reverse order of removing.</p>
4	Tension band assy <div> <p>(A) portion</p> <p>Tension pole assy</p> <p>FF brake</p> <p>②</p> <p>SP. reel disk</p> <p>Tension band assy</p> </div> <p>Fig. 2-3-6 Removal of Tension band</p>	<p>(1) Remove a screw ② and disengage the tension band from the (A) portion of the tension pole assy.</p> <p>(2) Operate the FF brake while taking out the tension band.</p> <p>(3) Engage a new tension band in the original position.</p> <p>(4) After replacement, check and adjust the tension pole position and back tension (see 2.5.1, page 2-14).</p>
5	Pinch roller <div> <p>③</p> <p>Pinch roller</p> </div> <p>Fig. 2-3-7 Removal of Pinch roller</p>	<p>(1) Remove a screw ③ and detach the pinch roller and its peripheral parts.</p> <p>(2) Install a new pinch roller and fix the collar and the pinch roller cap with the screw.</p>
6	FF, REW, SEARCH brake assembly <div> <p>REW brake</p> <p>①</p> <p>FF brake</p> <p>SEARCH brake</p> </div> <p>Fig. 2-3-8 Removal of brakes</p>	<p>(1) — REW, SEARCH brake — Lift the REW and SEARCH brake assemblies upwards with nippers or the like while press the locking pawl of them.</p> <p>(2) — FF brake — Remove a slit washer ① and lift the FF brake upwards while taking it out.</p>

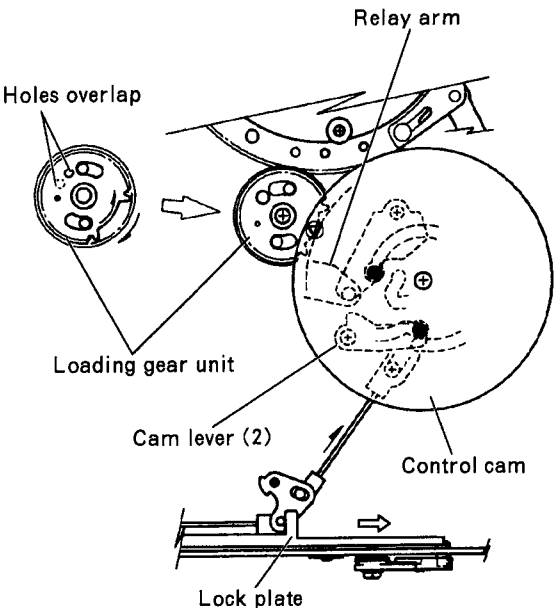
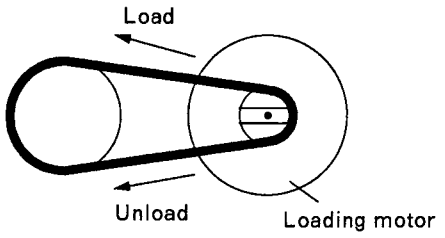
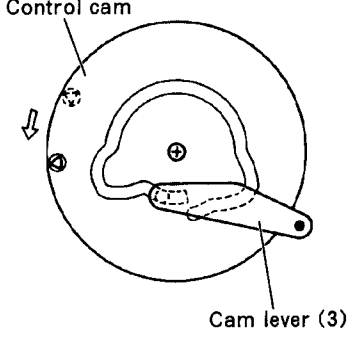
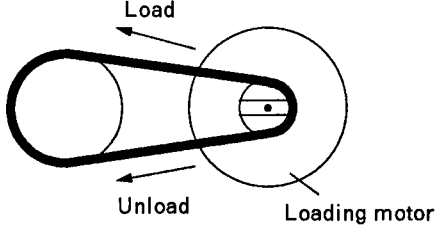
No.	Item	Adjustment and Check
7	<p>A/C head assembly — Removal —</p> <p>Fig. 2-3-9 Removal of A/C head</p>	<ol style="list-style-type: none"> (1) Disconnect the connector from the A/C head board. (2) Remove a screw ⑨ and release the bracket. (3) Remove a taper nut (a). (4) Remove a nut (b) and take out the A/C head assy with the head arm. (5) Remove three screws ④, ⑤ and ⑥, then remove the A/C head with careful attention to a spring under the screw ⑥ not to lose it. (6) Unsolder the A/C head board and remove it. <p><i>Note: If the guide sheet is removed, make sure to fix the guide sheet tightly, otherwise it may cause tape damage, etc.</i></p>
	<p>— Reinstallation —</p> <p>Fig. 2-3-10 Temporarily adjust the height</p>	<ol style="list-style-type: none"> (1) Reassemble the A/C head and the peripheral parts in the reverse order of removing. (2) Before setting the A/C head on the main deck, temporarily adjust the height of the A/C head as shown in Fig. 2-3-10.
	<p>— Check and Adjustment —</p>	<ol style="list-style-type: none"> (1) Perform the adjustments required after replacement of the A/C head assembly as described in 2.2.4, page 2-5.
8	<p>Full erase head</p> <p>Fig. 2-3-11 Removal of Full erase head</p>	<ol style="list-style-type: none"> (1) Remove an "E. ring" (a), and detach the impedance roller and its peripheral parts. (2) Disconnect the connector from the FE head. (3) Remove a spring and take out the FE head upwards for replacement. (4) Set a new FE head properly and install the impedance roller and peripheral parts. (5) After replacement, clean the tape transport system (see 2.2.5, page 2-5).

No.	Item	Adjustment and Check								
9	<div>Drum assembly</div> <div><p>FE head assy</p><p>Release arm assy Cleaner arm assy</p><p>Fig. 2-3-12 Removal of the drum assy</p></div>	<div><div>(1) Remove the compoments in the following order. The cassette panel (see 1.1.1, page 1-1). The left side cover assembly (see 1.1.2, page 1-1). The connector box (see 1.1.8, page 1-2). The PRE/REC board assembly (see 1.2.2, page 1-4).</div><div>(2) Remove a screw ⑧ and take out the cleaner arm assembly.</div><div>(3) Remove three screws ⑦ and draw out the drum assembly diagonally to the front side trying to avoid the FE head assembly and release arm assembly.</div><div>(4) With careful attention to the drum assembly to prevent it from getting damaged, install a new drum motor assembly in the reverse order of disassembly. Tighten screws evenly.</div><div>(5) Perform adjustments required after replacement of the drum assembly (see 2.2.3).</div></div>								
10	<div><div>Loading motor</div><div>Loading belt</div></div> <div><p>Motor bracket</p><p>Loading motor</p><p>Fig. 2-3-13 Removal of the loading motor and belt</p></div>	<div><div>(1) Remove the compoments in the following order. The right side cover assy (see 1.1.5, page 1-1). The video board (see 1.2.1, page 1-4).</div><div>(2) Disconnect the CN6 from the M.IF board.</div><div>(3) Remove two screws ⑨ and take out the motor bracket.</div><div>(4) Remove two screws ⑩ and disconnect wires from the loading motor.</div><div>(5) Disengage the loading belt and take out the loading motor.</div><div>(6) Install a new loading belt and a new loading motor in the reverse order of the removal. When wiring, pay attention to the polarity of wires.</div></div> <table><tr><th>Poles of motor</th><th>Color of wire</th></tr><tr><td>+</td><td>Red</td></tr><tr><td>(Red marking)</td><td></td></tr><tr><td>-</td><td>Gray</td></tr></table> <div>Fig. 2-3-14 Polarity of the loading motor</div>	Poles of motor	Color of wire	+	Red	(Red marking)		-	Gray
Poles of motor	Color of wire									
+	Red									
(Red marking)										
-	Gray									
11	<div>Capstan motor</div> <div><p>Reel belt</p><p>Capstan motor</p><p>Fig. 2-3-15 Removal of the capstan motor</p></div>	<div><p>Note: Be careful not to damage the capstan shaft.</p><div>(1) Remove the compoments in the following order. The right side cover assy (see 1.1.5, page 1-1). The video board, the S/S board and the REGULATOR board (see 1.2.1, page 1-4). The MECHA JUNC board (see 1.2.3 No.(2), page1-4).</div><div>(2) Disengage the reel belt from the capstan motor and disconnect the CN2 from the M.IF board.</div><div>(3) Remove three screws ⑪ and remove the capstan motor.</div><div>(4) When installing the capstan motor, place it in the A/C head side.</div></div>								

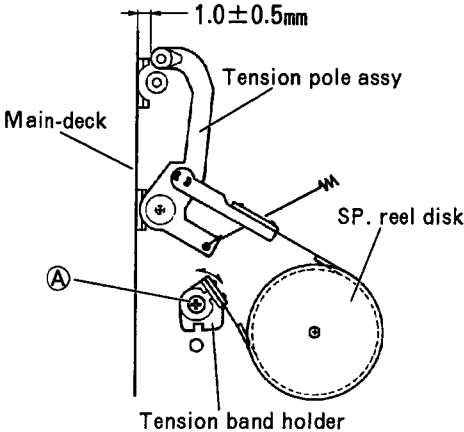
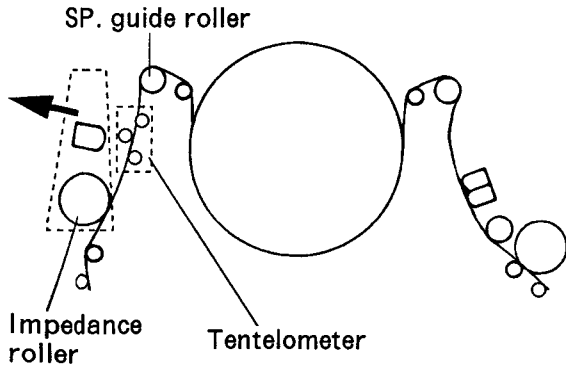
No.	Item	Adjustment and Check
12	Brush assembly  Fig. 2-3-16 Removal of the Brush assy	<ol style="list-style-type: none"> (1) Remove the components in the following order. The right side cover assy (see 1.1.5, page 1-1). The video board, the S/S board and the REGULATOR board (see 1.2.1, page 1-4). The MECHA JUNC board (see 1.2.3 No.(2), page 1-4). (2) Remove a screw ⑫ and replace the brush. (3) Apply PGJ04040 (BEACON-325) grease to the drum shaft. (4) Install the brush assembly so that it comes off the center of the drum shaft as shown below.  Fig. 2-3-17 Reinstallation of the Brush assy
13	SP. clutch SP. reel disk  Fig. 2-3-18 Removal of the SP. clutch and reel disk	<ol style="list-style-type: none"> (1) Separate the tension band from the tension pole assy. (2) Remove a slit washer ⑧ while pull out the SP. reel disk upwards as diengaging the FF brake. Note: Pay attention to the washer installed underneath the SP. reel disk. (3) Remove a slit washer ⑨ and pull out the SP. clutch upwards paying attention to the washer. (4) Install a new SP. clutch in the reverse order of the removal. (5) Clean the SP. reel shaft with alcohol, apply a drop of oil to SP. reel shaft. (6) Install a new SP. reel disk in the reverse order of the removal. (7) After replacement, check the back tension (see 2.5.1, page 2-14).
14	TU. clutch TU. reel disk  Fig. 2-3-19 Removal of the TU. clutch and reel disk	<ol style="list-style-type: none"> (1) Remove a slit washer ⑧ while pull out the TU. reel disk upwards as diengaging the REW brake and the SEARCH brake. Note: Pay attention to the washer installed underneath the TU. reel disk. (2) Remove a slit washer ⑨ and pull out the TU. clutch upwards paying attention to the washer. (3) Install a new TU. clutch in the reverse order of the removal. (4) Clean the TU. reel shaft with alcohol, apply a drop of oil to TU. reel shaft. (5) Install a new TU. reel disk in the reverse order of the removal.

2.4 REASSEMBLING OF MECHANISM

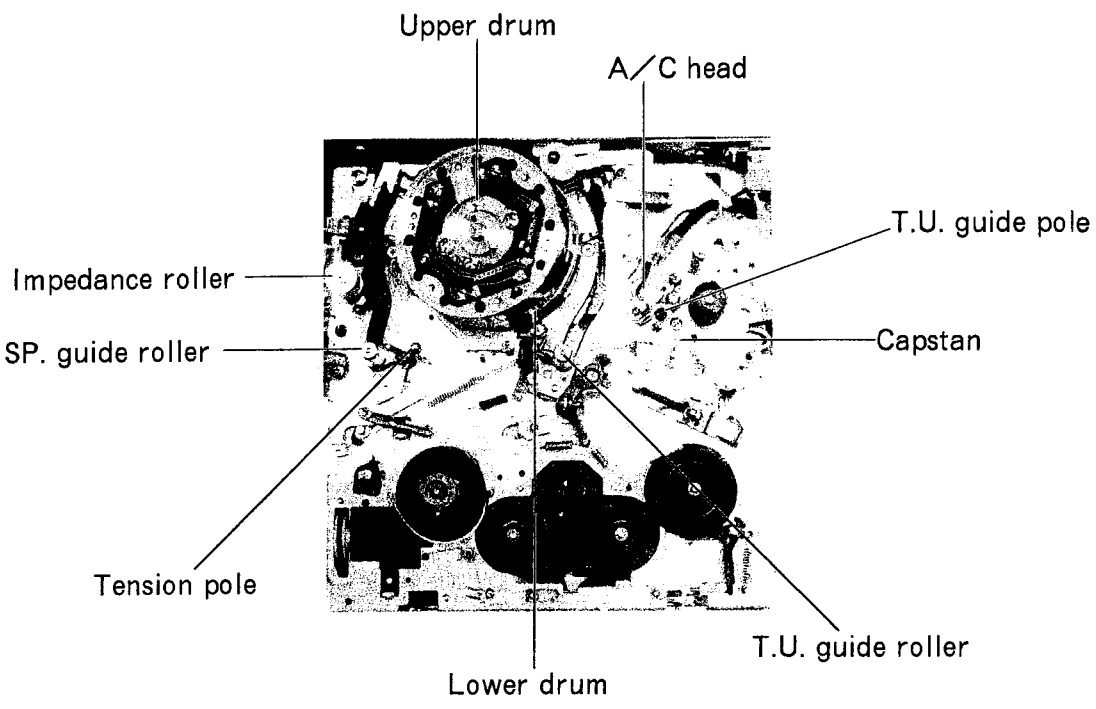
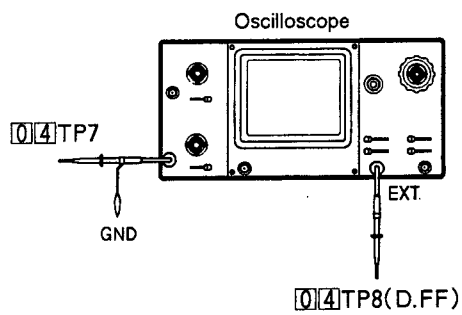
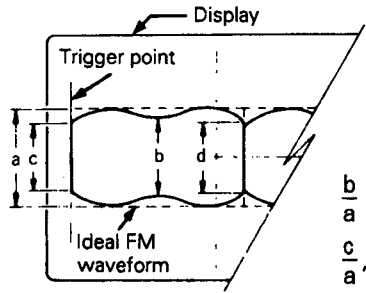
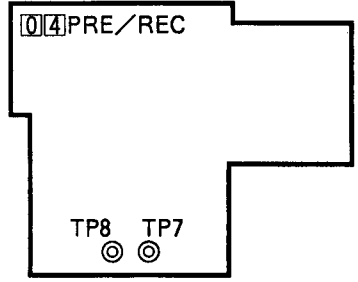
No.	Item	Adjustment and Check
	<p>There is a close relation between the mode sensor and the syscon circuit in the mechanism of this model, and mechanical operations of levers, gears, rollers and others mechanism parts are controlled by the condition of connection between the mode sensor and the control cam. Therefore, if those mechanism parts are incorrectly set, the mechanism may fall into malfunction. When reassembling, make sure to do all parts in the assembly position.</p>	
1	<p>Loading ring Connect gear</p>  <p>Fig. 2-4-1 Loading ring and connect gear</p>	<p>(1) Mount the TU. loading ring and connect gear (1) normally.</p> <p>(2) Set the SP. loading ring so that the large hole of the SP. loading ring coincide with hole of the TU. loading ring.</p> <p>(3) Keeping these correlative positions, set the connect gear (2) to gear with the loading rings.</p>
2	<p>Loading gear unit</p>  <p>Fig. 2-4-2 Installation of loading gear unit</p>	<p>(1) Install the loading gear unit so that the boss of the loading gear unit faces the small hole of the SP. loading ring. Note:No gear portion of the loading gear unit is toward right.</p>

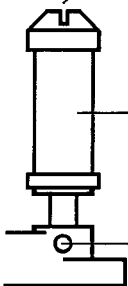
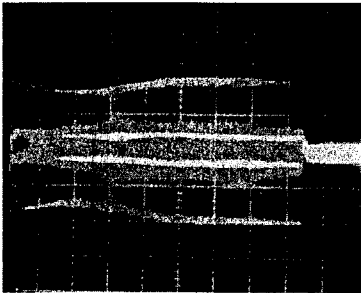
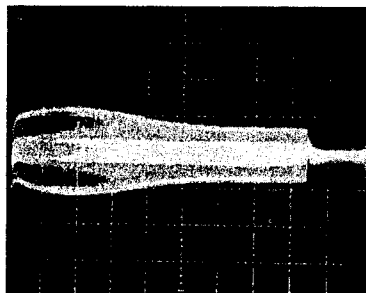
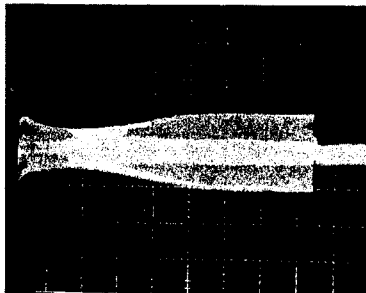
No.	Item	Adjustment and Check
3	<p>Control cam</p>  <p>Fig. 2-4-3 Installation of control cam</p>	<ol style="list-style-type: none"> (1) Turn the gears of the loading gear unit in the opposite directions so that the holes overlap each other, then insert a screwdriver etc. into the holes. (2) Shift the lock plate in the arrow direction to lock it. In this condition, the cassette housing lifts up. (3) Turn the cam lever (2) counter-clockwise fully. (4) Move the relay arm to the leftmost limit in the figure. (5) Then install the control cam so that the largest triangle mark of the control cam faces toward the center of the loading gear unit. (6) Turn the loading motor by hand, confirm that the control cam is able to rotate. (7) Take out the screwdriver etc. from the loading gear unit.  <p>Fig. 2-4-4 Rotational direction of Loading motor</p>
4	<p>Cam lever (3)</p>  <p>Fig. 2-4-5 Installatin of cam lever (3)</p>  <p>Fig. 2-4-6 Rotational direction of Loading motor</p>	<ol style="list-style-type: none"> (1) Turn the loading motor to loading direction by hand to rotate the control cam counter-clockwise, then set the cam lever (3) correctly as shown in the figure.

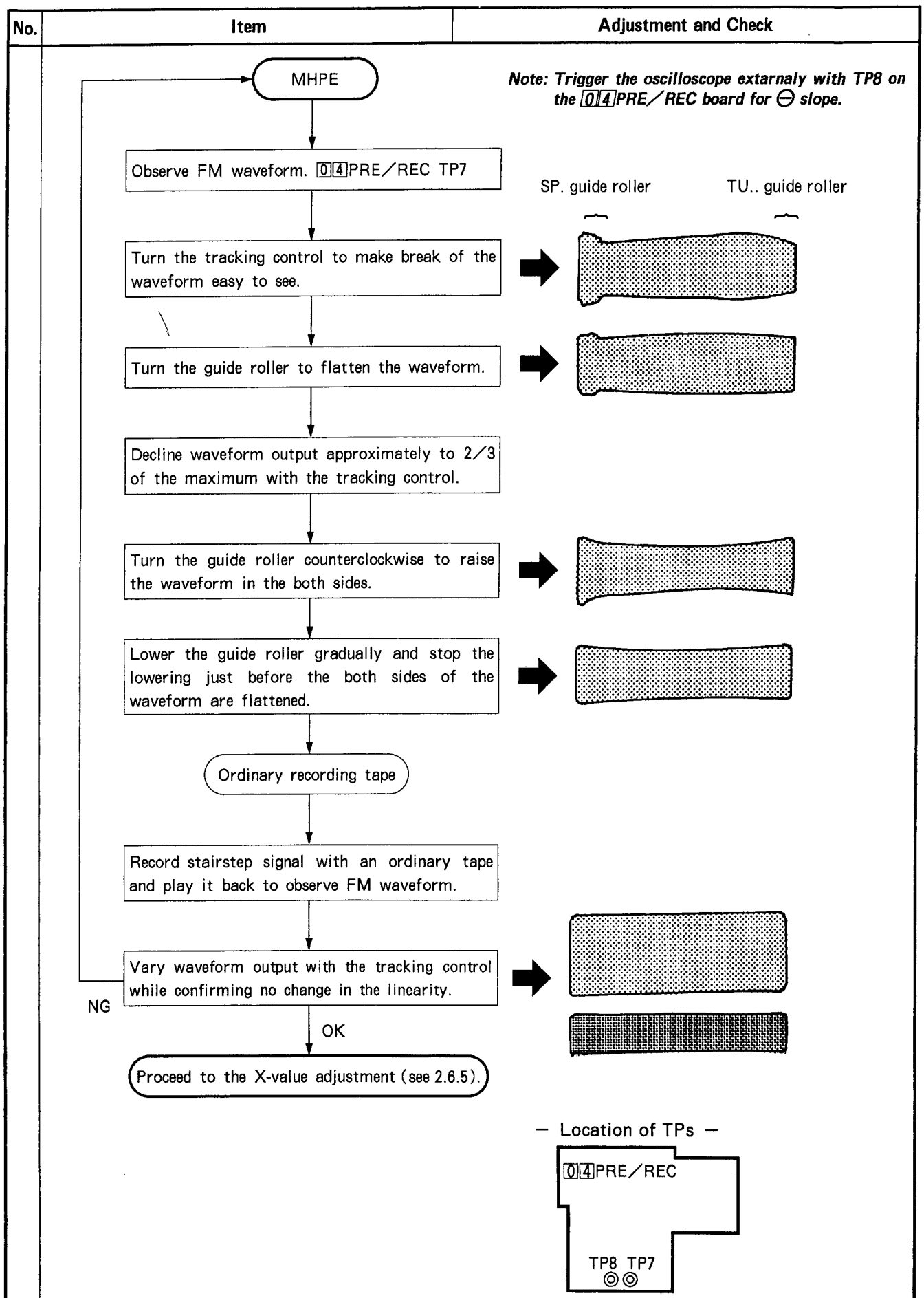
2.5 TAPE TENSION ADJUSTMENT

No.	Item	Adjustment and Check		
1	<p>Tension pole position adjustment</p>  <p>Fig. 2-5-1 Back tension adjustment</p>	<p>(1) Required instrument for this adjustment: •Cassette torque meter (PUJ42881)</p> <p>(2) Turn the power off and cassette tape is ejected, apply black tape or the like to the LED in the center of the deck to shut off infrared rays.</p> <p>(3) Turn on the power and set the mechanism to the Play mode without any cassette tape loaded. Again turn the power off and get the cassette housing to enter the eject state by hand. At that time, no cassette tape is loaded.</p> <p>(4) Loosen the screw ① a little and adjust the tension band holder in the position so that there is gap (1 mm) between the cutout of the main deck and the tension pole assy.</p> <p>(5) Tighten the screw ① to fix the tension band holder.</p> <p>(6) Remove the tape applied in the above step (2) and turn on the power.</p>		
	<p>— Check the back tension —</p> <table border="1"><tr><td>Back tention</td><td>42 ± 4g-cm</td></tr></table>	Back tention	42 ± 4g-cm	<p>(7) Mount a cassette torque meter and set the mechanism to the REC mode.</p> <p>(8) Confirm that the torque meter reads 38~46g-cm as the supply torque.</p> <p>(9) If the torque meter reads otherwise, clean the supply reel disk in the part that contacts the tension band and check the spring of the tension pole assy.</p> <p>(10) If the measurement result is still out of the standard, fine adjust the position of the tension band holder just in a range of ±0.5 mm between the tension pole assy and the cutout portion of the main deck. Again check the back tension.</p> <p>(11) After completing the above adjustment, apply screw sealant to the tension band holder.</p>
Back tention	42 ± 4g-cm			
	<p>— When use the Tentelometer —</p>  <table border="1"><tr><td>Back tention</td><td>24 ± 3g-cm</td></tr></table> <p>Fig. 2-5-2 Back tension check with Tentelometer</p>	Back tention	24 ± 3g-cm	<p>(1) Required instruments for this adjustment: •Tentelometer (PGJ04020)</p> <p>(2) Repeat the above steps (2) through (6).</p> <p>(3) Use a tape begin portion of E-180 cassette tape and set to the REC mode.</p> <p>(4) Measure the tension between the impedance roller and the supply guide roller, and make sure of it in the range between 21 and 27 g-cm.</p> <p>(5) If out of the standard, repeat the above steps (9) through (11).</p>
Back tention	24 ± 3g-cm			
2	<p>Take-up torque check</p> <table border="1"><tr><td>TU torque</td><td>60~100g-cm</td></tr></table>	TU torque	60~100g-cm	<p>(1) Required instruments for this adjustment: •Cassette torque meter (PUJ42881)</p> <p>(2) Mount a cassette torque meter and set the mechanism to the REC mode.</p> <p>(3) Confirm that the torque meter reads 60~100 g-cm as the take-up torque.</p>
TU torque	60~100g-cm			

2.6 INTERCHANGEABILITY ADJUSTMENT

No.	Item	Adjustment and Check
1	<p>Interchangeability must be adjusted after replacement of the upper drum assembly, drum assembly and A/C head assembly, etc.</p> <p>Names of main parts</p>  <p>Fig. 2-6-1 Names of main parts</p>	
2	<p>FM waveform check</p>  <p>Fig. 2-6-2 Connection of Oscilloscope</p>  <p>Fig. 2-6-3 FM waveform check</p>	<p>Note: Before loading any alignment tape, make sure to confirm nothing wrong in tape transport with an ordinary tape.</p> <ol style="list-style-type: none"> (1) For observing FM waveform, connect an oscilloscope with TP7 on ④④PRE/REC board while connecting the other probe with TP8 on ④④PRE/REC board for triggering it externally with \ominus slope. (2) Play back the alignment tape MHPE while turning the tracking control to maximize FM waveform. Referring to Fig. 2-6-3, check whether rate of each level to the maximum level "a" is as specified or not. (3) When the maximum level "a" is set for 4 scale divisions on the oscilloscope screen, "b" must be more than 3.6 scale divisions while "c" and "d" must be more than 3.2 scale divisions. <p>Note: To set the maximum level "a" for 4 scale divisions, adjust the gain control of the oscilloscope in addition to the tracking control that is set to maximum position.</p> <p>— Location of TPs —</p> 

No.	Item	Adjustment and Check
	<div> <p>START</p> <p>Play back alignment tape MHPE.</p> <p>FM waveform meets the specifications?</p> <p>YES</p> <p>FM waveform is maximum as tracking control is set to the center position?</p> <p>YES</p> <p>FINISH</p> </div>	<p><i>Note: Trigger the oscilloscope extarnaly with TP8 on the 04PRE/REC board for \ominus slope.</i></p> <p>NO</p> <p>Adjust linearity of FM waveform (see 2.6.3).</p> <p>NO</p> <p>Adjust X-value (see 2.6.5).</p>
3	<p>Interchangeability adjustment</p> <p>— Linearity adjustment —</p> <div> <p>Turn with screw-driver.</p> <p>Guide roller</p> <p>Setscrew : 1.27mm</p>  </div> <p>Fig. 2-6-4 Names of Pole base</p> <div>  <p>Tracking center</p> </div>	<p>(1) Precautions for adjustment:</p> <ul style="list-style-type: none"> For interchangeability adjustment, play back the alignment tape MHPE. If FM dropout cannot be corrected by adjusting the guide roller, it needs to replace the drum assembly. This replacement should apply only to the case that waveforms of CH-1 and CH-2 have the same tendency. The following pictures show FM waveforms when the lower drum is worn. Required tool: Hex. key (1.27 mm) <div>  <p>Tracking (—)</p> </div> <div>  <p>Tracking (+)</p> </div>

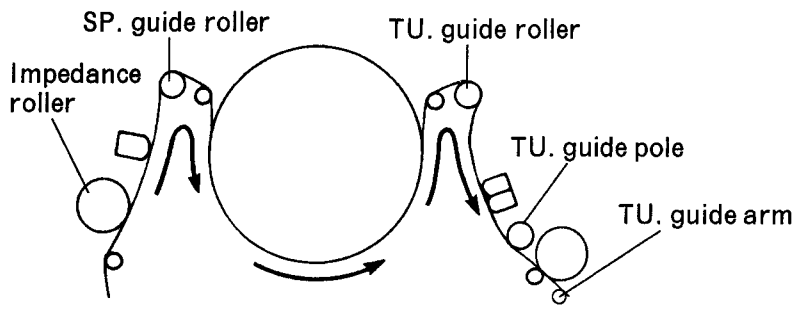
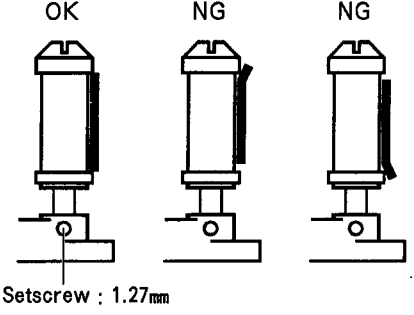
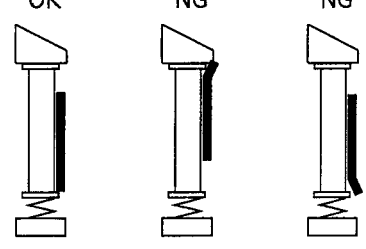
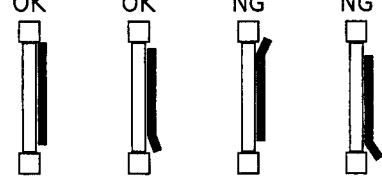


No.	Item	Adjustment and Check
4	A/C head adjustment If the A/C head is improperly positioned, it results in dropdown of output level or poor S/N ratio in playback audio signal, moreover, misaligned servo without picking-up of control signal at the worst.	<div> </div> <div> <p>(a): height</p> </div> <div> <p>(c): azimuth</p> </div> <div> <p>(b): tilt</p> </div> <div> <p>A/C head assy</p> </div> <div> <p>TU. guide pole</p> </div> <div> <p>(d): not turn</p> </div> <div> <p>Fig. 2-6-5</p> </div> <div> <p>No phase difference (less than 0.1msec).</p> </div> <div> </div> <div> <p>Audio signal</p> </div> <div> <p>Fig. 2-6-6</p> </div> <div> </div> <div> <p>Parallel check plate : PUJ50204(0.1mm) PGJ04039(0.15mm)</p> </div> <div> <p>A/C head</p> </div> <div> <p>OK</p> </div> <div> <p>0.1mm</p> </div> <div> <p>NG</p> </div> <div> <p>Turn screw (b) clockwise.</p> </div> <div> <p>NG</p> </div> <div> <p>Turn screw (b) counter clock- wise.</p> </div> <div> <p>The bent should be 0.15 mm or less in the forward direction as measured with the top edge.</p> </div> <div> <p>Fig. 2-6-7 Parallel check of A/C head</p> </div> <div> <p>(1) Required implements:</p> </div> <div> <ul style="list-style-type: none"> • Alignment tape : MBAE-3, MHPE • Parallel check plate : PUJ50204(0.1), PGJ04039(0.15) </div> <div> <p>(2) Rough check of A/C head height before adjustment</p> </div> <div> <ol style="list-style-type: none"> ① In the stage of tape transport check before height adjustment, temporarily adjust the height of the A/C head in order to prevent alignment tape from damage as well as to perform adjustment with ease. </div> <div> <p>(3) Tilt (forward bent) adjustment</p> </div> <div> <ol style="list-style-type: none"> ① Adjust the screw (b) with the parallel check plate (PUJ50204) so that tilt of the A/C head is 0.1mm. (See Fig. 2-6-7.) If there is a gap above the A/C head (this is interpreted as a little tilt), tighten the screw (b) to increase the tilt of the A/C head. On the other hand, if there is a gap underneath the A/C head, loosen the screw (b) to decrease the tilt. </div> <div> <ol style="list-style-type: none"> ② Confirm that tape is neither damaged nor wrinkled around the lower flange of the take-up guide pole. If tape is wrinkled, fine adjust the height of the take-up guide pole (see 2.7.3, page 2-20). </div> <div> <p>(4) Height and azimuth adjustments</p> </div> <div> <ol style="list-style-type: none"> ① Connect an oscilloscope's CH-1 with AUDIO OUT CH-1(L ch) while connecting CH-2 with AUDIO OUT CH-2(R ch), and set it to the chop mode. ② Set the AUDIO OUT switch positioned side panel to "NORM" position. ③ Play back the alignment tape MBAE-3 while adjusting the A/C head height with the hex. nut (a) to minimize both output levels of CH-1 and CH-2. (Height adjustment) ④ Play back the alignment tape MHPE while adjusting the screw (c) so that CH-1 and CH-2 output waveforms accord with each other in the phase and their outputs become maximum. (Azimuth adjustment) ⑤ Repeat the above steps No.③ and No.④ alternately for more precise adjustment. </div> <div> <p>(5) A/C head parallel check</p> </div> <div> <ol style="list-style-type: none"> ① Confirm that tilt of the A/C head is less than 0.15mm with the parallel check plate (PGJ04039). ② If it is out of the specifications, repeat the above steps (3) and (4). </div> <div> <ol style="list-style-type: none"> ⑥ After completing the above adjustment, apply screw sealant to the screws (b), (c), (d) and a nut (a). </div>

No.	Item	Adjustment and Check
5	<p>X-value adjustment</p> <p>If X-value is adjusted improperly, it results in time lag between picture and normal sound in playback of a tape that is recorded with a set whose X-value is correctly adjusted.</p> <div> <p>Apply screw sealant.</p> <p>A/C head assy</p> <p>(e)</p> </div> <p>Fig. 2-6-8</p> <div> <p>Adjust two phases. (± 1Field)</p> <p>1CH 2CH 1CH 2CH 1CH TP7 (FM)</p> <p>AUDIO OUT (CH-1)</p> </div> <p>Fig. 2-6-9</p> <div> <p>• Manner of external synchronization:</p> <ol style="list-style-type: none"> ① Set the oscilloscope's time sweep to 10 msec. ② In the condition that the oscilloscope is synchronized with D. FF signal, turn the oscilloscope's HOLD OFF control in the direction of (+) to stabilize non-recorded portion. </div> <div> <p>— Location of TPs —</p> <p>PRE/REC</p> <p>TP9</p> <p>TP3</p> <p>TP8 TP7</p> </div>	<ol style="list-style-type: none"> (1) Required implements: <ul style="list-style-type: none"> • Taper nut driver : PUJ50637 • Alignment tapes : MBPE-X, MH-F8 (2) Preparation <ol style="list-style-type: none"> ① Connect CH-1 of the oscilloscope with TP7 on PRE/REC board while connecting CH-2 with AUDIO OUT CH-1. ② Trigger the oscilloscope externally with signal from TP8 on PRE/REC board (D. FF). ③ Set the tracking to center position. (3) Play back the alignment tape MBPE-X. (4) Adjust the taper nut (e) with the taper nut driver to maximize FM output and to accord phases of audio and FM signals with each other in their non-recorded portions. (5) Connect CH-1 of the oscilloscope with TP3 on PRE/REC board. (6) Trigger the oscilloscope externally with signal from TP9 on PRE/REC board (A. FF). (7) Play back the alignment tape MH-F8 and adjust the taper nut (e) so that the FM waveform is maximum at a point the nearest position of the above step (4) with the tracking control set at the center. (8) After completing the above adjustment, apply screw sealant to the nut (e).








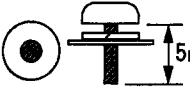




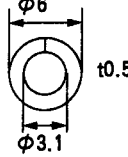
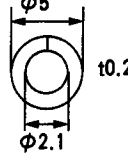
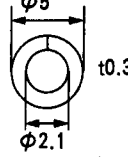
2.7 ADJUSTMENT OF TAPE TRANSPORT SYSTEM

Note: The tape transport system has been precisely adjusted at the factory before shipment. Check and adjustment are required only after the parts of the tape transport system are replaced.

No.	Item	Adjustment and Check
1	Location of parts  <p style="text-align: center;">Fig. 2-7-1 Names of Tape guides</p>	
2	SP. guide rolloer TU. guide rolloer  <p style="text-align: center;">Setscrew : 1.27mm</p> <p style="text-align: center;">Fig. 2-7-2 Height adjustment of SP. & TU. guide roller</p>	<ol style="list-style-type: none"> (1) Required tool : •Hexagon head key (1.27 mm) (2) Slightly loosen the setscrew under the guide roller. (3) Play an ordinary thin tape (more than E-240 tape). (4) Adjust the height of the guide roller temporarily so that the tape smoothly runs. (5) Tighten the setscrew. (6) After the temporary adjustment, check the FM waveform.
3	TU. guide pole  <p style="text-align: center;">Fig. 2-7-3 Height adjustment of TU. guide pole</p>	<ol style="list-style-type: none"> (1) Play an ordinary thin tape (more than E-240 tape). (2) Adjust the height of the take-up guide pole so that the tape smoothly runs on the lower flange of the take-up guide pole. (Lower edge alignment) (3) Check that the tape is not damaged at near the take-up guide pole and the guide arm in the following modes several times respectively. PLAY→S.REV→S.FWD→STILL→PLAY (4) When there is any result unsatisfactory in the above step (3), turn the take-up guide pole within a quarter round to lower the height and repeat the check mentioned in the above step (3). (5) This adjustment result must be checked again after the A/C head adjustment (see 2.6.4) is completed. (6) After the adjustment, apply screw sealant to the screw.
4	TU. guide arm  <p style="text-align: center;">Fig. 2-7-4 Height adjustment of TU. guide arm</p>	<ol style="list-style-type: none"> (1) Required tool : •Hexagon head key (0.9 mm) (2) Set to S.REV mode an ordinary thin tape (more than E-240 tape). (3) Adjust the height of the TU. guide arm with set screw so that the tape is not damaged at upper frange of the TU. guide arm. (Upper edge alignment) (4) After the adjustment, apply screw sealant to the set screw.

2.8 TABLE OF SCREWS AND SLIT WASHERS USED IN THIS SET

Note: The numbers of screws and slit washers shown below respectively accord with numbers of them appearing in this section.

<p>① (gold)</p>  <p>PDM4165A (M3)</p>	<p>② (gold)</p>  <p>SDSP2605Z</p>	<p>③ (silver)</p>  <p>SPSP2005Z</p>	<p>④ (black)</p>  <p>PQ43687B (M2.6)</p>	<p>⑤ (gold)</p>  <p>PQ44621 (M2.6)</p>
<p>⑥ (gold)</p>  <p>SDSP2612Z</p>	<p>⑦ (gold)</p>  <p>SDSP2606Z</p>	<p>⑧ (gold)</p>  <p>DPSP2005Z</p>	<p>⑨ (gold)</p>  <p>SDST2605Z</p>	<p>⑩ (gold)</p>  <p>SDSP2004Z</p>
<p>⑪ (gold)</p>  <p>SDSP2604Z</p>	<p>⑫ (gold)</p>  <p>SDST2005Z</p>			
<p>Ⓐ</p>  <p>PQM30017-24 (red)</p>	<p>Ⓑ</p>  <p>PQM30017-26 (red)</p>	<p>Ⓒ</p>  <p>PQM30017-2 (black)</p>		

SECTION 3 ELECTRICAL ADJUSTMENT

3.1 PRECAUTIONS

- (1) Before proceeding to any electrical adjustment, it is the first prerequisite to confirm that the objective item is out of order or of breakdown.
Moreover, for parts and items that need correct mechanical adjustment prior to electrical adjustment, begin by confirming that they are exactly mechanically adjusted.
- (2) Make sure to start electrical adjustment 5 or more minutes after the power is turned on.

3.1.1 Required tools and test instruments

Besides the special implements shown in Fig. 3-1-1, the following test instruments are necessary for electrical adjustment.

- Frequency counter (10MHz or more and 100mV or less in the sensitivity)
- Video signal generator (TG-7/2, Model 1411, or equivalent)
- Digital voltmeter (available for 1mV_{DC} or under)
- Sweep signal generator (100kHz to 10MHz, or equivalent)
- Oscilloscope (dual-trace type, for more than 50MHz)
- TV monitor
- Vectorscope (521A or equivalent)
- Audio tester
- Extension board for S/S and REGULATOR board (PGJ05046 Unnecessary for adjustments)

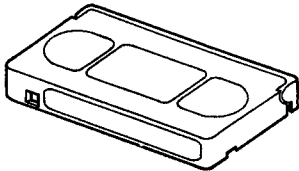
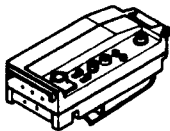
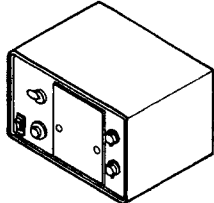
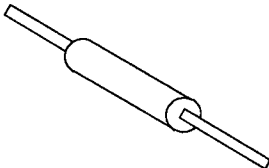
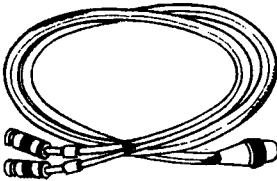
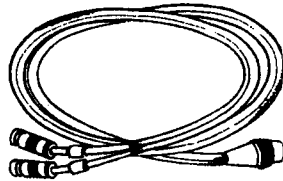
Alignment tapes MHPE, MHVE-2H, MHVE-2, MBAE, MH-8, MH-F8	Camera adapter SA-S41E or PGS20167G	Carrier checker PGJ05008-2
	Use the camera adapter when signal is input. 	
Adjusting driver YTU93004-2	7-pin output conversion cable PGJ05018	7-pin input conversion cable PGJ05028
	 7-pin(male)→BNC×2	 BNC×2→7-pin(female)

Fig. 3-1-1 Required special implements

3.1.2 Specification of alignment tapes

•MHPE

Video signal	Audio signal	Application	Remark
VHS SP mode Stairstep	6kHz	•For check adjustment of interchangeability •For adjustment of PB switching point	MH-2 stairstep signal substitutable.

•MHVE-2

Video signal	Audio signal	Application	Remark
VHS SP mode Color bar	—	•For check and adjustment of video PB circuit	MH-2 color bar signal is substitutable.

•MHVE-2H

Video signal	Audio signal	Application	Remark
S-VHS SP mode Color bar	—	•For check and adjustment of video PB circuit	MH-2H color bar signal is substitutable.

•MBAE

Video signal	Audio signal	Application	Remark
CTL signal only	1kHz(0dB)	•For check and adjustment of audio PB circuit	MH-2 1kHz signal is substitutable.

•MH-8

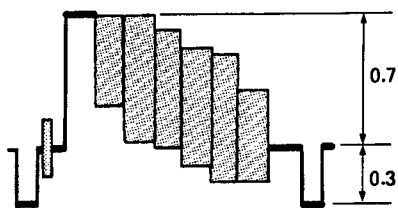
No.	PB time	Video signal	Audio signal	Application
1	2 minutes	Color sweep	400Hz(−10dB)	<ul style="list-style-type: none"> • Check and adjustment of video signal's frequency response in PB circuit. • Check and adjustment of audio signal's frequency response in PB circuit.
2	2 minutes	Color sweep	100Hz(−10dB)	
3	2 minutes	Color sweep	8kHz(−10dB)	
4	4 minutes	Color sweep	—	

•MH-F8

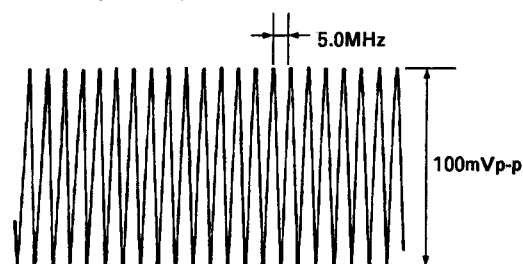
No.	PB time	Video signal	Audio signal	Application
1	5 minutes	—	Carrier only	Check and adjustment of interchangeability of mechanism.
2	5 minutes	Stairstep	Carrier only	Check and adjustment of interchangeability of mechanism.
3	5 minutes	—	1kHz (±50kHz DEV)	Check and adjustment of FM audio PB circuit.

3.1.3 Signals required for video system adjustment

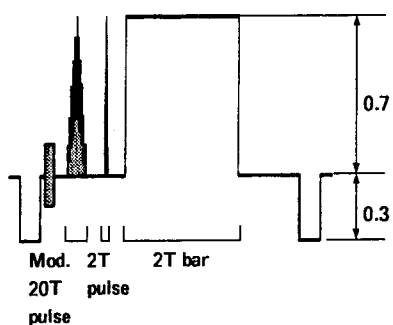
(1) EBU 75% color bar



(4) Sine wave (5.0MHz)

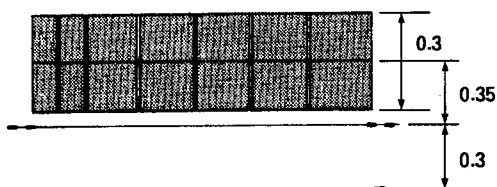


(2) Pulse and bar signal



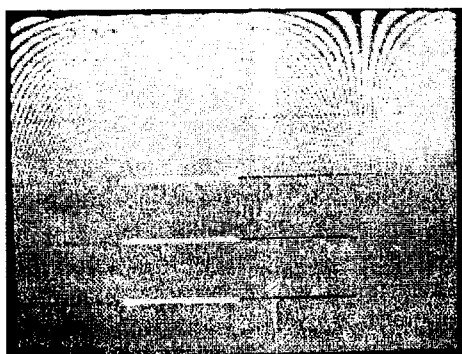
Unit (Vp-p)

(3) Video sweep signal (100kHz to 5MHz)

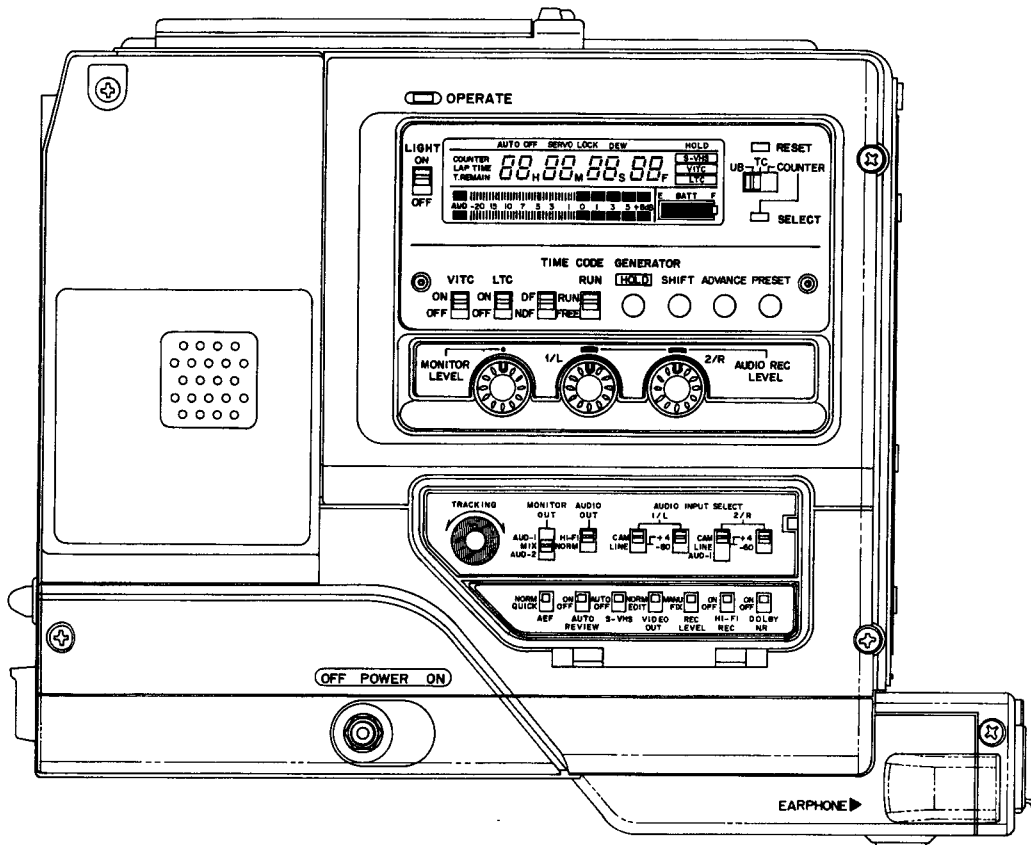


To supply this signal through the LINE IN terminal, make sure to use a sweep signal having a good characteristic in the H correlation in order to avoid erroneous operation of comb filters.

For a reference, a signal having a good H correlation shows such a clear pattern as neighboring black and white lines are the same in the width and the interval on the monitor as shown in the figure below.



3.1.4 Initial setting of switches




- Unless otherwise specified, check and adjustment should be done with the following switch setting.

VIDEO OUT SELECT switch : VTR
TALLY switch (Operation panel) : ON

[Internal switches of P.C. boards]

Refer to the subsection 1.2 "Internal switches".

AUDIO board SW21 : OFF
SW22 : OFF
SW23 : ON
VIDEO board SW1 : OFF ()
AUTO EQ board SW1-1 : ON
SW1-2 : ON
SW1-3 : ON
SW1-4 : OFF
SW1-5 : OFF (not used)
SW1-6 : OFF (not used)

MONITOR OUT switch : MIX
AUDIO OUT switch : HiFi
AUDIO INPUT SELECT switch
1/L : CAM
+4
2/R : CAM
+4
AEF switch : NORM
AUTO REVIEW switch : OFF
S-VHS switch : AUTO
VIDEO OUT switch : NORM
REC LEVEL switch : MANU
HiFi REC switch : ON
DOLBY NR switch : OFF

Notes:

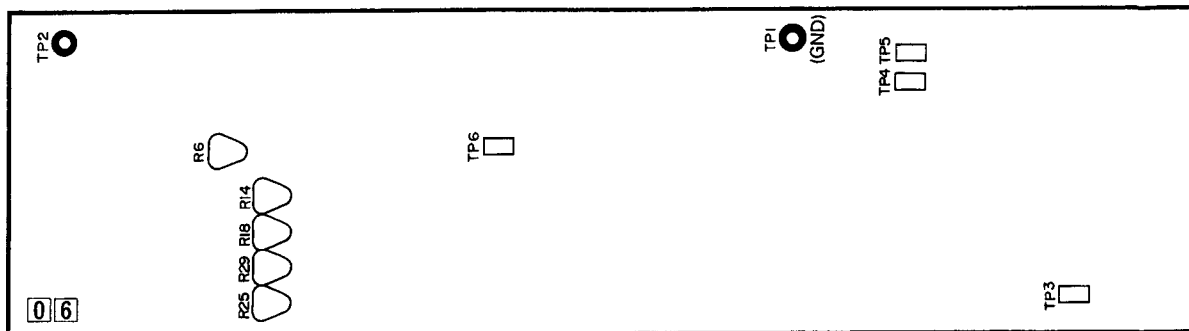
- When switch setting is changed from the original position according to direction for an item, make sure to reset it to the initial position every time the adjustment of the item is completed.
- Check and adjustment should be performed at least 5 minutes after the power switch was turned on.
- For recording and playing back a tape for check and adjustment, use a double-coated tape.

[Switches on the side cover]

LIGHT switch : ON
COUNTER switch : COUNTER
VITC switch : OFF
LTC switch : OFF
DF-NDF : DF
RUN switch : RUN

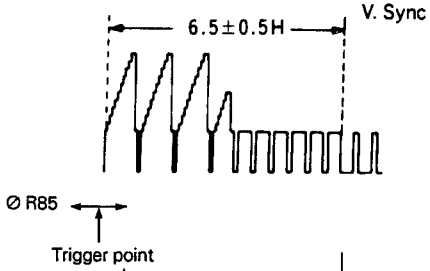
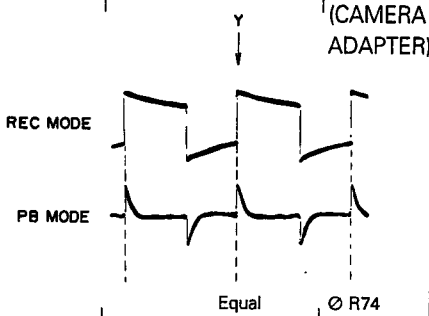
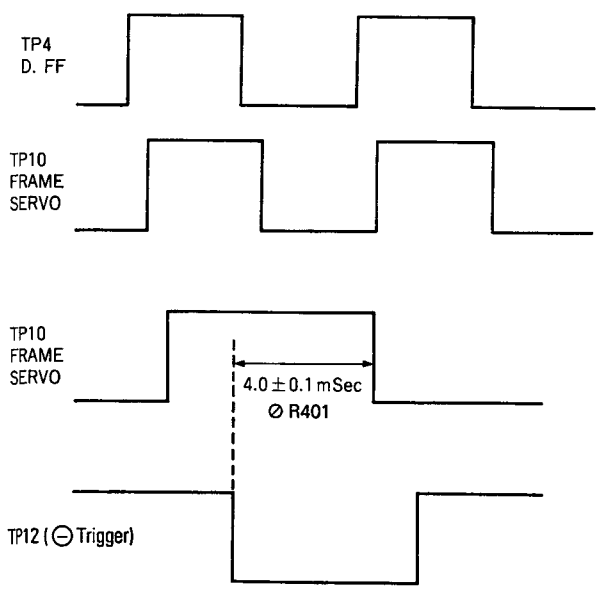
3.2 REGULATOR CIRCUIT

— Location of TP & VR —



No.	Item	Check Point	Adjustment Parts	Signal	Mode	Check and Adjustment
1	Regulated voltage	TP6 0 6	R14 0 6 <div style="border: 1px solid black; padding: 2px; display: inline-block;">$100.0 \pm 3 \text{ kHz}$ $\varnothing R14$</div>	Color bar ↓ (CAMERA ADAPTER)	REC	1) Connect a frequency counter to TP6. 2) Adjust R14 so that the frequency counter reads $100.0 \pm 3.0 \text{ kHz}$.
		TP3 0 6	R25 0 6 <div style="border: 1px solid black; padding: 2px; display: inline-block;">$9.10 \pm 0.05 \text{ VDC}$ $\varnothing R25$</div>	Color bar ↓ (CAMERA ADAPTER)	REC	1) Connect a digital voltmeter to TP3. 2) Adjust R25 so that the voltmeter reads $9.10 \pm 0.05 \text{ V}$.
		TP4 0 6	R29 0 6 <div style="border: 1px solid black; padding: 2px; display: inline-block;">$5.25 \pm 0.05 \text{ VDC}$ $\varnothing R29$</div>	Color bar ↓ (CAMERA ADAPTER)	REC	1) Connect a digital voltmeter to TP4. 2) Adjust R29 so that the voltmeter reads $5.25 \pm 0.05 \text{ V}$.
		TP5 0 6	R18 0 6 <div style="border: 1px solid black; padding: 2px; display: inline-block;">$5.25 \pm 0.05 \text{ VDC}$ $\varnothing R18$</div>	Color bar ↓ (CAMERA ADAPTER)	REC	1) Connect a digital voltmeter to TP5. 2) Adjust R18 so that the voltmeter reads $5.25 \pm 0.05 \text{ V}$.
		TP2 0 6	R6 0 6 <div style="border: 1px solid black; padding: 2px; display: inline-block;">$9.10 \pm 0.05 \text{ VDC}$ $\varnothing R6$</div>	—	STOP	1) Connect a digital voltmeter to TP2. 2) Adjust R6 so that the voltmeter reads $9.10 \pm 0.05 \text{ V}$.
2	Battery voltage detection	—	R110 0 5	Color bar ↓ (CAMERA ADAPTER)	REC	1) Adjust DC source voltage so that it is $10.95 \pm 0.02 \text{ V}$ at the DC IN terminal of the VTR section. 2) Adjust R110 so that the set enters the BATT. WARNING mode (REC TALLY LED blinks). 3) Raise the input voltage to the DC IN terminal to the normal rate (REC TALLY LED lights). 4) Decline the DC input voltage gradually while confirming that the set enters the BATT. WARNING mode with the voltage of $10.95 \pm 0.05 \text{ V}$. Note: In the case the set enters the WARNING mode at setting of the source voltage, adjust the input voltage to the normal range by turning R110.

3.3 SERVO CIRCUIT

No.	Item	Check Point	Adjustment Parts	Signal	Mode	Check and Adjustment
1	PB SW point	VIDEO OUT TP4 05 (Ext. trigger)	R85 05	MHPE	PB	<ol style="list-style-type: none"> 1) Connect an oscilloscope's probe to the VIDEO OUT terminal while connect the other probe to TP4 for external trigger. (Sweep time/div. range: 5.0 μ, (-) slope) 2) Play the alignment tape MHPE while adjusting the TRACKING control to maximize the FM waveform. 3) Adjust R85 so that the switching point is set 6.5 H before V. sync. 4) Set the oscilloscope for observing on the (+) slope while confirming that a time lag in the switching point is less than 1.0 H.
						
2	Tracking preset	TP11 05 TP4 05 (Ext. trigger)	R74 05	Stairstep ↓ Y/C 443 IN (CAMERA ADAPTER)	REC ↓ PB	<ol style="list-style-type: none"> 1) Check the TRACKING control set to the center click position. 2) Connect the oscilloscope's probe to TP11 and the set the VTR to the REC mode. 3) Adjust the oscilloscope's X (horizontal) axis to position the rise point of the CTL pulse on an optional Y axis. 4) Set the VTR to the PB mode and adjust R74 so that the rise point of the CTL pulse observed at TP11 matches with the Y axis determined in the above step 3).
						
3	Frame servo	TP4 05 TP10 05 TP12 05	R401 05	Color bar ↓ Y/C 443 IN (CAMERA ADAPTER)	REC	<ol style="list-style-type: none"> 1) Supply the color bar signal to the Y/C IN terminal of the camera adapter. 2) Conenct the oscilloscope's probes to TP4 and TP10. 3) Set the VTR to the REC mode and confirm that FRAME pulse and D. FF pulse are locked. 4) Change the probe connection from TP4 to TP12. 5) Adjust R401 so that the period from the fall of TP12's signal to the fall of TP10's signal is 4.0 ± 0.1 msec.
						

3.4 AUDIO CIRCUIT

- Notes:
- For adjustments that are specified to perform in the REC mode, input the color bar signal.
 - When an adapter is used for input of audio signal, input -6 dBs signal.
 - When audio signal is directly input through the 50-pin connector, input -20 dBs signal.
 - When audio signal is input through the LINE IN connector, input +4 dBs signal.

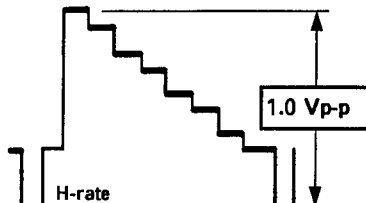
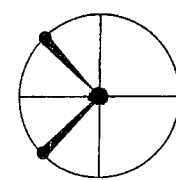
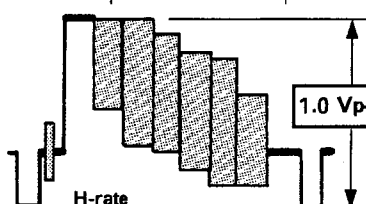
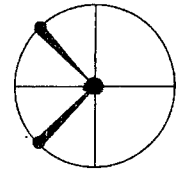
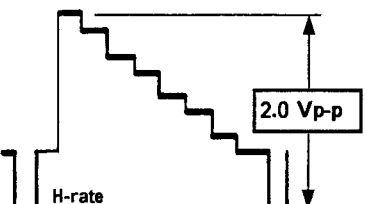
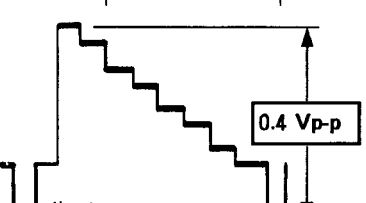
No.	Item	Check Point	Adjustment Parts	Signal	Mode	Check and Adjustment
1	Audio level meter	LEVEL INDICATOR	R152 0 7 (L) R154 0 7 (R)	1 kHz, -6 dBs ↓ (CAMERA ADAPTER)	EE	1) Connect the CAMERA adapter assembly (SA-S41E, PGS20167G) to the camera section. 2) Supply 1 kHz, -6 dBs signal to the AUDIO IN terminal of the adapter. HiFi REC : ON NR : OFF AUDIO OUT : HiFi 3) Adjust the AUDIO REC LEVEL VR so that output level at the AUDIO OUT terminal is -6 dBs. <i>Note: Do not disturb the above setting of the AUDIO REC LEVEL VR until the adjustment of this item is completed.</i> 4) Adjust R152 and R154 so that the audio level meter indicates 0 dB. In concrete, adjust the VRs to turn on the indicator LEDs one after another from the utmost minus side and fix them when the LED to indicate 0 dB turns on.
2	Normal audio EE level	AUDIO OUT (with non-load termination)	R277 0 7 (L) R307 0 7 (R)	1 kHz, -6 dBs ↓ (CAMERA ADAPTER)	EE	1) Connect the CAMERA adapter assembly (SA-S41E, PGS20167G) to the camera section. 2) Supply 1 kHz, -6 dBs signal to the AUDIO IN terminal of the adapter. HiFi REC : ON NR : OFF AUDIO OUT : NORM 3) Connect an audio tester to the AUDIO OUT terminal. Adjust R277 and R307 to obtain -6.0 dBs as output level.
	EE level	-6.0 dBs	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> ∅ R277 (CH-1) ∅ R307 (CH-2) </div>			
3	Alarm level	TP5 0 7	R120 0 7	—	EE	1) Connect the audio tester to TP5. HiFi REC : ON NR : OFF AUDIO OUT : HiFi 2) Forward the tape until it reaches the tape end in the FF mode. 3) Activate the alarm at the tape end while adjusting R120 to set alarm level to -50 dBs.
	Alarm level	-50 dBs	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> ∅ R120 </div>			

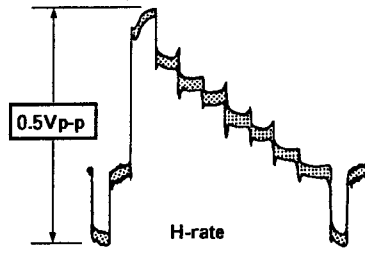
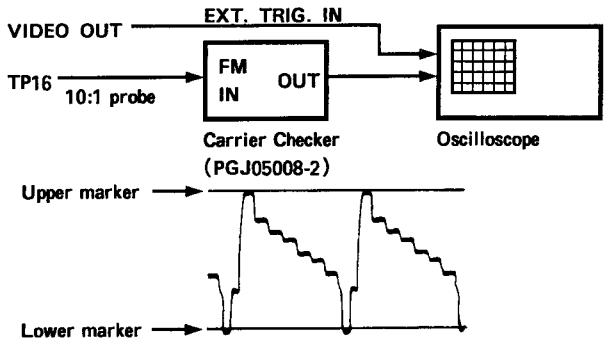
No.	Item	Check Point	Adjustment Parts	Signal	Mode	Check and Adjustment							
4	Normal audio PB level	AUDIO OUT (with non-load termination)	R271 <table border="1"><tr><td>0</td><td>7</td></tr></table> (L) R301 <table border="1"><tr><td>0</td><td>7</td></tr></table> (R)	0	7	0	7	MBAE	PB	1) Connect the audio tester to the AUDIO OUT terminal. HiFi REC : ON NR : OFF AUDIO OUT : NORM 2) Play the alignment tape MBAE. 3) Adjust R271 and R301 to obtain -9.0 dBs as the output level on the both channels.			
	0	7											
0	7												
	PB level	-9.0 dBs	Ø R271 (CH-1) Ø R301 (CH-2)										
5	Normal audio PB frequency response	AUDIO OUT (with non-load termination)	R265 <table border="1"><tr><td>0</td><td>7</td></tr></table> (L) R295 <table border="1"><tr><td>0</td><td>7</td></tr></table> (R)	0	7	0	7	MH-8 400 Hz, 8 kHz	PB	1) Connect the audio tester to the AUDIO OUT terminal. HiFi REC : ON NR : OFF AUDIO OUT : NORM 2) Play the alignment tape MH-8. 3) Adjust R265 and R295 so that the 8 kHz signal level is 0 dB compared with the 400 Hz signal level. <i>Note: Through the above adjustment, set the MONITOR LEVEL VR to the minimum position.</i>			
	0	7											
0	7												
		<table border="1"><tr><td>400 Hz</td><td>8 kHz</td></tr><tr><td>0 dB (Reference)</td><td>0 dB</td></tr></table>	400 Hz	8 kHz	0 dB (Reference)	0 dB							
400 Hz	8 kHz												
0 dB (Reference)	0 dB												
6	Normal audio REC level	AUDIO OUT (with non-load termination)	R254 <table border="1"><tr><td>0</td><td>7</td></tr></table> (L) R284 <table border="1"><tr><td>0</td><td>7</td></tr></table> (R)	0	7	0	7	1 kHz, -6 dBs ↓ (CAMERA ADAPTER)	REC <table border="1"><tr><td>V</td><td>H</td><td>S</td></tr></table> ↓ PB	V	H	S	1) Supply 1 kHz, -6 dBs signal to the AUDIO IN terminal of the adapter. HiFi REC : ON NR : OFF AUDIO OUT : NORM 2) Connect the audio tester to the AUDIO OUT terminal. 3) Record the 1 kHz, -6 dBs signal and play it back in the VHS mode. 4) Adjust R254 and R284 to obtain -6.0 dBs as the output level on the both channels. <i>Note: There is a slight difference in the sensitivity owing to tape used.</i>
	0	7											
0	7												
V	H	S											
	REC level	-6.0 dBs	Ø R254 (CH-1) Ø R284 (CH-2)										

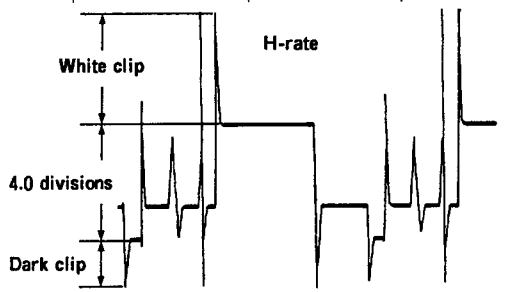
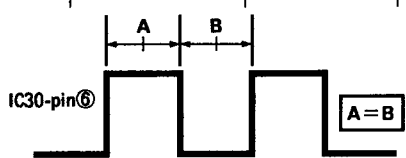
No.	Item	Check Point	Adjustment Parts	Signal	Mode	Check and Adjustment		
7	Normal audio REC/PB frequency response	AUDIO OUT (with non-load termination)	S-VHS R332 07 (L) R333 07 (R)	1 kHz, -26 dBs 10 kHz, -26 dBs ↓ (CAMERA ADAPTER)	REC S-VHS ↓ PB	1) Supply 1 kHz, -26 dBs signal to the AUDIO IN terminal of the adapter. HiFi REC : ON NR : ON AUDIO OUT : NORM 2) Connect the audio tester to the AUDIO OUT terminal. 3) Record the signal and play it back both in the S-VHS mode. 4) Adjust R332 and R333 so that the 10 kHz signal level is 0 ± 1.0 dB compared with the 1 kHz signal level.		
			<table><tr><td>1 kHz</td><td>10 kHz</td></tr><tr><td>0 dB (Reference)</td><td>0 ± 1.0 dB</td></tr></table> VHS R334 07 (L) R335 07 (R)	1 kHz	10 kHz	0 dB (Reference)	0 ± 1.0 dB	
1 kHz	10 kHz							
0 dB (Reference)	0 ± 1.0 dB							
8	FM audio carrier frequency	TP25 07 TP24 07	R237 07 (1.4 MHz) R211 07 (1.8 MHz)	—	REC VHS	1) Connect the frequency counter to TP25. 2) Operate recording in the VHS mode. HiFi REC : ON NR : OFF AUDIO OUT : HiFi 3) Adjust R237 to obtain 1.400 ± 0.005 MHz as the carrier frequency. 4) Connect the frequency counter to TP24. 5) Adjust R211 to obtain 1.800 ± 0.005 MHz as the carrier frequency.		
		<table><tr><td rowspan="2">FMA carrier frequency</td><td>1.400 ± 0.005 MHz</td><td>Ø R237</td></tr><tr><td>1.800 ± 0.005 MHz</td><td>Ø R211</td></tr></table>	FMA carrier frequency	1.400 ± 0.005 MHz	Ø R237	1.800 ± 0.005 MHz	Ø R211	
FMA carrier frequency	1.400 ± 0.005 MHz	Ø R237						
	1.800 ± 0.005 MHz	Ø R211						
9	FM audio PB level	AUDIO OUT (with non-load termination)	R230 07 (L) R205 07 (R)	MH-F8	PB	1) Connect the audio tester to the AUDIO OUT terminal. HiFi REC : ON NR : OFF AUDIO OUT : HiFi 2) Play the alignment tape MH-F8. 3) Adjust R230 and R205 to obtain -5.0 dBs as the signal level on the both channels.		
			<table><tr><td>FMA PB level</td><td>-6.0 dBs</td><td>ØR230 (L ch) ØR205 (R ch)</td></tr></table>	FMA PB level	-6.0 dBs	ØR230 (L ch) ØR205 (R ch)		
FMA PB level	-6.0 dBs	ØR230 (L ch) ØR205 (R ch)						

3.5 VIDEO CERCUIT

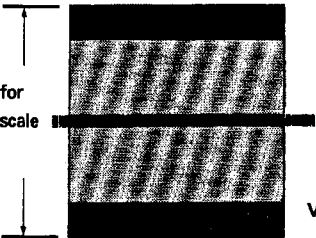
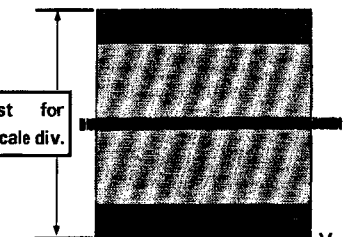
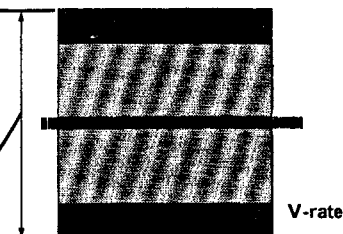
Note: Connect the camera adapter (SA-S41E, PGS20167G) to the camera section.

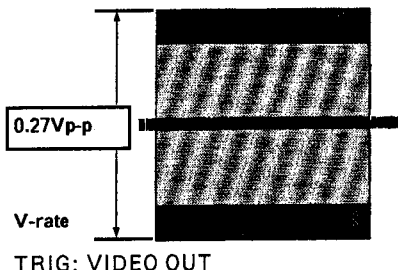
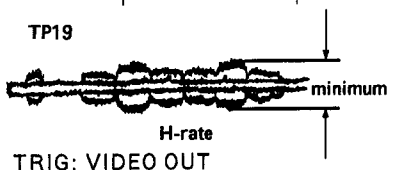
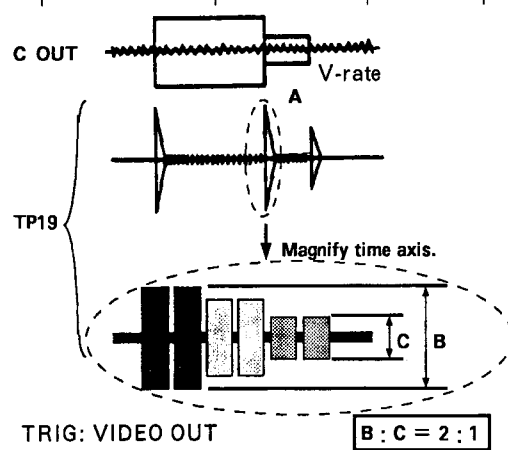
No.	Item	Check point	Adjustment	Signal	Mode	Check and Adjustment
1	Y/C EE output level	Y OUT C OUT (75Ω terminator)	R61[0][1](Y) R135[0][1](C)	Color bar ↓ Y/C 443 IN (CAMERA ADAPTER)	EE	<p>(1) Connect the oscilloscope to the Y OUT with 75Ω terminator.</p> <p>(2) Adjust R61 to obtain 1.0Vp-p as Y level.</p> <p>(3) Supply EBU color bar signal directly to the vectorscope while adjusting the GAIN VR so that the burst level crosses the scope's circumference.</p> <p>(4) Connect the vectorscope to the C OUT while adjusting R135 so that the burst level is the same as in the step (3).</p>
						
2	VIDEO EE output level	VIDEO OUT (75Ω terminator)	R66[0][1](Y) R134[0][1](C)	Color bar ↓ Y/C 443 IN (CAMERA ADAPTER)	EE	<p>(1) Connect the oscilloscope to the VIDEO OUT with 75Ω terminator.</p> <p>(2) Adjust R66 to obtain 1.0Vp-p as Y level.</p> <p>(3) Supply EBU color bar signal directly to the vectorscope while adjusting the GAIN VR so that the burst level crosses the scope's circumference.</p> <p>(4) Connect the vectorscope to the VIDEO OUT while adjusting R134 so that the burst level is the same as in the step (3).</p>
						
3	AGC	TP5[0][1]	R371[0][1]	Color bar ↓ Y/C 443 IN (CAMERA ADAPTER)	EE	<p>(1) Connect the oscilloscope to TP5.</p> <p>(2) Adjust R371 so that the signal level is 2.0Vp-p.</p>
						
4	REC process input level	TP6[0][1]	R293[0][1]	Color bar ↓ Y/C 443 IN (CAMERA ADAPTER)	REC S-VHS	<p>(1) Connect the oscilloscope to TP6.</p> <p>(2) Perform recording in the S-VHS mode.</p> <p>(3) Adjust R293 so that the signal level is 0.4Vp-p.</p>
						


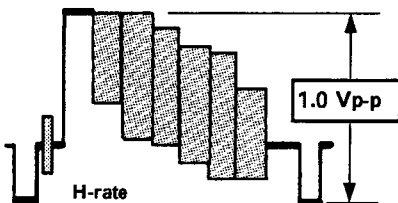
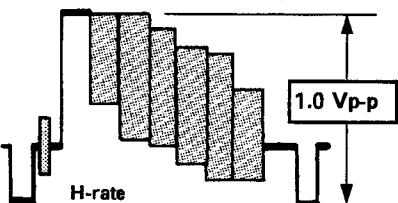
No.	Item	Check point	Adjustment	Signal	Mode	Check and Adjustment														
5	REC process output level	TP8 $\begin{smallmatrix} 0 \\ 1 \end{smallmatrix}$	R296 $\begin{smallmatrix} 0 \\ 1 \end{smallmatrix}$	Color bar ↓ Y/C 443 IN (CAMERA ADAPTER)	REC S-VHS	(1) Connect the oscilloscope to TP8. (2) Perform recording in the S-VHS mode. (3) Adjust R296 so that the signal level is 0.5Vp-p.														
																				
6	Carrier & deviation	TP16 $\begin{smallmatrix} 0 \\ 1 \end{smallmatrix}$	R349 $\begin{smallmatrix} 0 \\ 1 \end{smallmatrix}$ (CARRI) R350 $\begin{smallmatrix} 0 \\ 1 \end{smallmatrix}$ (DEVI)	Color bar ↓ Y/C 443 IN (CAMERA ADAPTER)	REC S-VHS	<p>Note: This adjustment needs the carrier checker (PGJ05008-2).</p> <p>(1) Connect the carrier checker and an oscilloscope as shown in the figure.</p> <p>(2) Set the carrier checker for S-VHS mode and set the DEVI/BAL switch to the "DEVI" position.</p> <p>(3) Perform recording in the S-VHS mode.</p> <p>(4) Align the sync tip with the lower marker with R349, while align the 100% white with the upper marker with R350.</p> <p>Note: Confirm that both the sync-tip and the 100% white are aligned with the markers respectively.</p>														
																				
			R347 $\begin{smallmatrix} 0 \\ 1 \end{smallmatrix}$ (CARRI) R348 $\begin{smallmatrix} 0 \\ 1 \end{smallmatrix}$ (DEVI)		REC VHS	(5) Perform recording in the VHS mode. (6) In the same manner as the above step (4), use R347 and R348 to align the sync tip and the 100% white with the lower and upper markers respectively.														
<table><tr><th rowspan="2">MODE</th><th colspan="2">CARRIER</th><th rowspan="2">DEVIATION</th></tr><tr><th>SYNC TIP</th><th>100%WHITE</th></tr><tr><td>S-VHS</td><td>5.4MHz \bigcircR349</td><td>7.0MHz \bigcircR350</td><td>1.6MHz</td></tr><tr><td>VHS</td><td>3.8MHz \bigcircR347</td><td>4.8MHz \bigcircR348</td><td>1.0MHz</td></tr></table>							MODE	CARRIER		DEVIATION	SYNC TIP	100%WHITE	S-VHS	5.4MHz \bigcirc R349	7.0MHz \bigcirc R350	1.6MHz	VHS	3.8MHz \bigcirc R347	4.8MHz \bigcirc R348	1.0MHz
MODE	CARRIER		DEVIATION																	
	SYNC TIP	100%WHITE																		
S-VHS	5.4MHz \bigcirc R349	7.0MHz \bigcirc R350	1.6MHz																	
VHS	3.8MHz \bigcirc R347	4.8MHz \bigcirc R348	1.0MHz																	

No.	Item	Check point	Adjustment	Signal	Mode	Check and Adjustment						
7	White & Dark clip	TP15[0][1]	R358[0][1] (White clip) R362[0][1] (Dark clip)	Pulse & bar ↓ Y/C 443 IN (CAMERA ADAPTER)	REC S-VHS	(1) Perform recording in the S-VHS mode. (2) Adjust the oscilloscope's GAIN VR to set the portion between the sync tip and the 100% white for 4.0 scale divisions on the scope. (3) In the above condition, adjust R358 so that the white clip is 4.4 scale divisions (210%) while adjust R362 so that the dark clip is 2.4 scale divisions. (60%)						
			 <table><tr><th>MODE</th><th>White clip</th><th>Dark clip</th><th>Sync tip — 100%White</th></tr><tr><td>S-VHS</td><td>4.4 divisions ⓄR358</td><td>2.4 divisions ⓄR362</td><td>4.0 divisions</td></tr><tr><td>VHS</td><td>3.6 divisions ⓄR359</td><td>1.8 divisions ⓄR361</td><td>4.0 divisions</td></tr></table>		MODE	White clip	Dark clip	Sync tip — 100%White	S-VHS	4.4 divisions ⓄR358	2.4 divisions ⓄR362	4.0 divisions
MODE	White clip	Dark clip	Sync tip — 100%White									
S-VHS	4.4 divisions ⓄR358	2.4 divisions ⓄR362	4.0 divisions									
VHS	3.6 divisions ⓄR359	1.8 divisions ⓄR361	4.0 divisions									
			R359[0][1] (White clip) R361[0][1] (Dark clip)		REC VHS	(4) Perform recording in the VHS mode. (5) In the same manner as the above steps (2) and (3), adjust the white clip to be 3.6 scale divisions (190%) with R359 and the dark clip to be 1.8 scale divisions (45%) with R361.						
8	S-VHS mode detection	IC30-pin⑥ [0][1]	R600[0][1]	Sine wave (5.0MHz) ↓ TP29[0][1]	PB	(1) Make shortcircuits between TP30 and TP31 on the video board. (2) Supply 5.0MHz/100mVp-p sine wave to TP29. (3) Use a blank tape (not yet used), set to the play mode. (4) Adjust R600 so that the duty factor is fifty-fifty (A=B in the figure).						
9	REC FM level	TP1[0][2]	R5[0][2]	Color bar ↓ Y/C 443 IN (CAMERA ADAPTER)	REC S-VHS	(1) Perform recording in the S-VHS mode. (2) Adjust R5 so that the pedestal level is 210mVp-p.						
			R4[0][2]		REC VHS	(3) Perform recording in the VHS mode. (4) Adjust R4 so that the pedestal level is 210mVp-p.						
												
					0.21Vp-p ⓄR5(S-VHS) ⓄR4(VHS)							
TRIG: [1][1] PRE/REC JUNC TP3 (D-FF)												

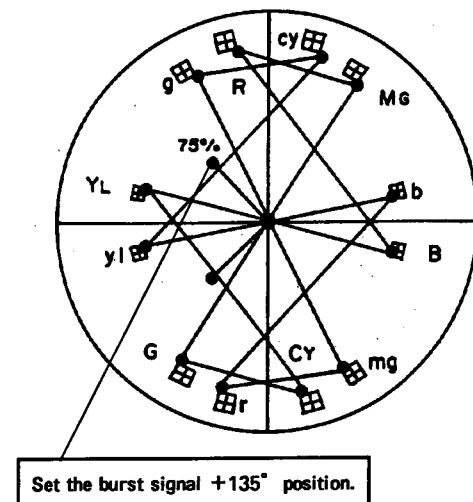
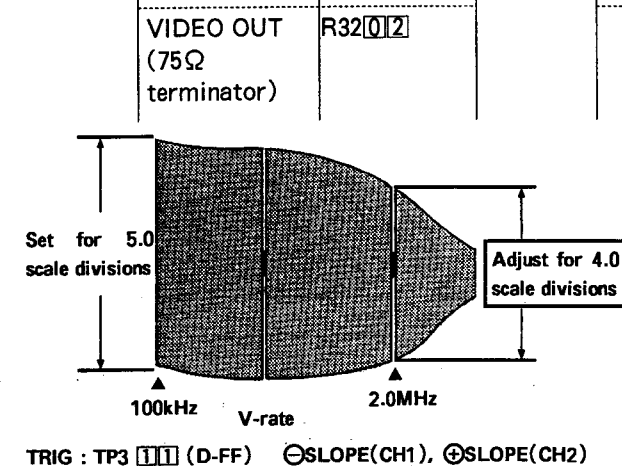
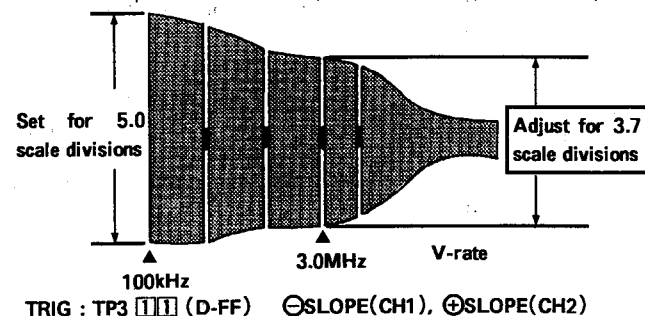
No.	Item	Check point	Adjustment	Signal	Mode	Check and Adjustment
10	4.43VCXO	TP25[0][1] TP25 : 4.433619MHz \pm 50Hz	C268[0][1]	MHVE-2H	PB	(1) Make shortcircuits between TP24 and TP-GND on the video board. (2) Play back the alignment tape MHVE-2H. (3) Adjust C268 so that the frequency counter reads 4.433619 MHz \pm 50Hz.
11	VCO	C264[0][1] (upper side) C264 (upper side) : 3.20V _{cc}	C255[0][1]	MHVE-2H	PB	(1) Connect the digital voltmeter to upper side of C264. (2) Play back the alignment tape MHVE-2H. (3) Adjust C255 for 3.20V _{cc} .
12	Pilot burst phase & level	TP27[0][1]	C237[0][1] (Phase) R492[0][1] (Level)	Color bar ↓ Y/C 443 IN (CAMERA ADAPTER)	REC S-VHS	(1) Make shortcircuits between TP24 and TP-GND on the video board. (2) Connect the oscilloscope's CH1 input to TP27. (3) Supply the scope's CH1 output to a vectorscope while supplying SC output of a signal generator to its EXT. REF terminal. (4) Adjust the phase of the burst signal by the PHASE VR so that the signal is normally positioned in the vectorscope screen. (5) Adjust C237 so that the phase of the pilot burst signal meets the U axis at an angle of 270° (in a downward direction). (6) Adjust the level of the burst signal by the GAIN VR so that the burst signal level is 5.0 scale divisions on the oscilloscope screen. (7) Adjust R492 so that the level of the pilot burst signal becomes 5.5 scale divisions (110%) on the screen.
13	REC Y/C delay	TP6[0][1] TP4[0][2] TP9[0][1] TP5[0][2]	R68[0][2] R73[0][2]	Pulse & bar ↓ Y/C 443 IN (CAMERA ADAPTER)	REC S-VHS REC VHS	(1) Connect the oscilloscope to TP6 and TP4 for ADD mode. (2) Perform recording in the S-VHS mode. (3) Set the center of the 20T pulse on the base as shown on the left and adjust R68 so that A:B = 5:0.4. (4) If nearly a flat wave cannot be obtained by the above step, make the waveform of the 20T pulse symmetric in the both sides of the pulse center. (5) Connect the oscilloscope to TP9 and TP5 for ADD mode. (6) Perform recording in the VHS mode. (7) Set the center of the 20T pulse on the base as shown on the left and adjust R73 so that A:B = 5:0.5. (8) If nearly a flat wave cannot be obtained by the above step, make the waveform of the 20T pulse symmetric in the both sides of the pulse center.

No.	Item	Check point	Adjustment	Signal	Mode	Check and Adjustment
14	REC color level	TP22[0][1]	R108[0][2]	MHVE-2H	PB	(1) Play back the MHVE-2H alignment tape. <i>Note: Adjust the TRACKING VR to the best tracking position.</i> (2) Adjust the oscilloscope's GAIN control to set the higher channel output level at TP22 for 5.0 scale divisions.
		<p>- MHVE-2H PB -</p>  <p>Set for 5.0 scale div.</p> <p>TRIG : [][] PRE/REC JUNC TP3 (D-FF) ⊖ SLOPE(CH1), ⊕ SLOPE(CH2)</p> <p>- S-VHS mode -</p>  <p>Adjust for 6.3 scale div.</p> <p>TRIG : [][] PRE/REC JUNC TP3 (D-FF) ⊖ SLOPE(CH1), ⊕ SLOPE(CH2)</p>	Color bar ↓ Y/C 443 IN (CAMERA ADAPTER)	REC S-VHS ↓ PB	(3) Record the color bars signal in the S-VHS mode and play it back. (4) Adjust R108 so that the level of same channel as the step (2) at TP22 is 6.3 scale divisions (+2dB).	
		R105[0][2]	MHVE-2	PB	(5) In the same manner as for the S-VHS mode, adjust for the VHS mode. (6) With the MHVE-2 alignment tape being played back, set the higher channel level for 5.0 scale divisions respectively. <i>Note: Adjust the TRACKING VR to the best tracking position.</i>	
		<p>- VHS mode -</p>  <p>PB level of self-recorded signals -1.0dB as against the PB level of the alignment tape.</p> <p>TRIG : [][] PRE/REC JUNC TP3 (D-FF) ⊖ SLOPE(CH1), ⊕ SLOPE(CH2)</p>	Color bar ↓ Y/C 443 IN (CAMERA ADAPTER)	REC VHS ↓ PB	(7) Record the color bar signal in the VHS mode and play it back. (8) Adjust R105 so that TP22's level of the same channel as the step (6) becomes 4.5 scale divisions (-1.0dB).	

No.	Item	Check point	Adjustment	Signal	Mode	Check and Adjustment
15	CNR input level	TP20[0][1]	R426[0][1]	Color bar ↓ Y/C 443 IN (CAMERA ADAPTER)	REC S-VHS ↓ PB	(1) Record the color bar signal in the S-VHS mode and play it back. (2) Adjust R426 so that the level is 0.27Vp-p.
						
16	CNR NC balance	TP19[0][1]	R424[0][1] L30[0][1]	Color bar ↓ Y/C 443 IN (CAMERA ADAPTER)	REC S-VHS ↓ PB	(1) Record the color bar signal in the S-VHS mode and play it back. (2) Alternately adjust R424 and L30 to minimize the signal level.
						
17	CNR feedback gain	TP19[0][1]	R425[0][1]	MHVE-2	PB	(1) Shortcircuit between TP11 and GND on the video board. (2) Magnify the portion "A" of the waveform by the oscilloscope's time axis. (3) In the magnified view of the waveform, set the portion "B" (maximum amplitude) for 4.0 scale divisions on the oscilloscope with its GAIN control. (4) Adjust R425 so that the level "C" 2H after the maximum amplitude "B" becomes 2.0 scale divisions. (5) After the adjustment, remove the shorting wire.
						

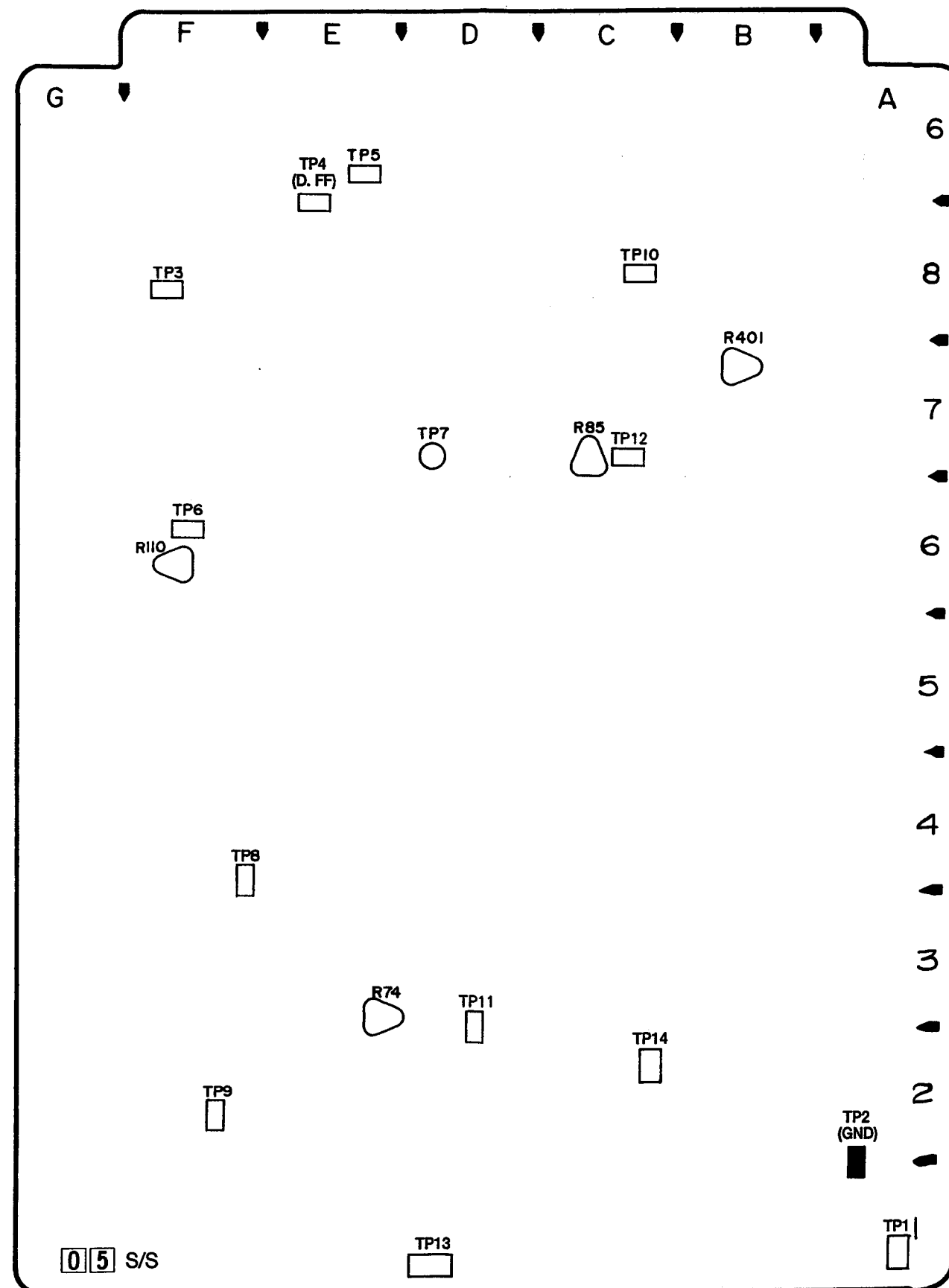
No.	Item	Check point	Adjustment	Signal	Mode	Check and Adjustment
18	CCD (Non-correlation pulse)	TP11[0][1]	R173[0][1]	Color bar ↓ Y/C 443 IN (CAMERA ADAPTER)	REC S-VHS ↓ PB	(1) Record the color bar signal in the S-VHS mode and play it back. (2) Adjust R173 to minimize signal leve "A".
	(CCD level)	TP13[0][1]	R610[0][1]			(3) Adjust R610 to minimize signal leve "A".
	(COMB level)	TP12[0][1]	R196[0][1]			(4) Adjust R196 to minimize signal leve "A".
	 <p>V-rate TRIG: VIDEO OUT</p>					
19	VIDEO PB Y level	VIDEO OUT (75Ω terminator)	R390[0][1]	Color bar ↓ Y/C 443 IN (CAMERA ADAPTER)	REC S-VHS ↓ PB	(1) Record the color bar signal in the S-VHS mode and play it back. (2) Adjust R390 so that Y level is 1.0Vp-p.
			R389[0][1]		REC VHS ↓ PB	(1) Record the color bar signal in the VHS mode and play it back. (2) Adjust R389 so that Y level is 1.0Vp-p.
	 <p>H-rate</p> <p>1.0 Vp-p</p>					
	 <p>H-rate</p> <p>1.0 Vp-p</p>					

No.	Item	Check point	Adjustment	Signal	Mode	Check and Adjustment
20	Frequency response	Y OUT (75Ω terminator)	R49[0]2 (CH1) R54[0]2 (CH2)	Video sweeper ↓ Y/C 443 IN (CAMERA ADAPTER)	REC S-VHS ↓ PB	<p>(1) Record the sweep signal in the S-VHS mode and play it back.</p> <p>(2) Adjust the oscilloscope's GAIN control to set the 100kHz signal level of higher channel for 5.0 scale divisions on the scope.</p> <p><i>Note: Turn off the oscilloscope's 20MHz filter.</i></p> <p>(3) Adjust R49(R54) so that the 3.0MHz signal level becomes 3.7 scale divisions (−2.5dB) respectively.</p>
		VIDEO OUT (75Ω terminator)	R32[0]2		REC VHS ↓ PB	<p>(4) Record the sweep signal in the VHS mode and play it back.</p> <p>(5) Adjust the oscilloscope's GAIN control to set the 100kHz signal level of higher channel for 5.0 scale divisions on the scope.</p> <p>(6) Adjust R32 so that the 2.0MHz signal level of the same channel as the step (5) is 4.0 scale divisions (−2.0dB) respectively.</p>
21	Chroma level & phase	VIDEO OUT (75Ω terminator)	R416[0]1 C198[0]1	Color bar ↓ Y/C 443 IN (CAMERA ADAPTER)	REC S-VHS ↓ PB	<p>(1) Record the color bar signal in the S-VHS mode and play it back.</p> <p>(2) Adjust the vectorscope's GAIN control so that the burst signal is positioned in the normal position (+135°).</p> <p>(3) Alternately adjust R416 and C198 so that the magenta level is observed in the center of the "田" mark.</p>



■ LOCATION OF TP & VR

— SYSCON/SERVO —



— SYSCON/SERVO —

TP4 (D. FF) TP5

TP3 TP10

R401

TP7 R85 TP12

TP6 R110

TP8

TP9 R74 TP11

TP14

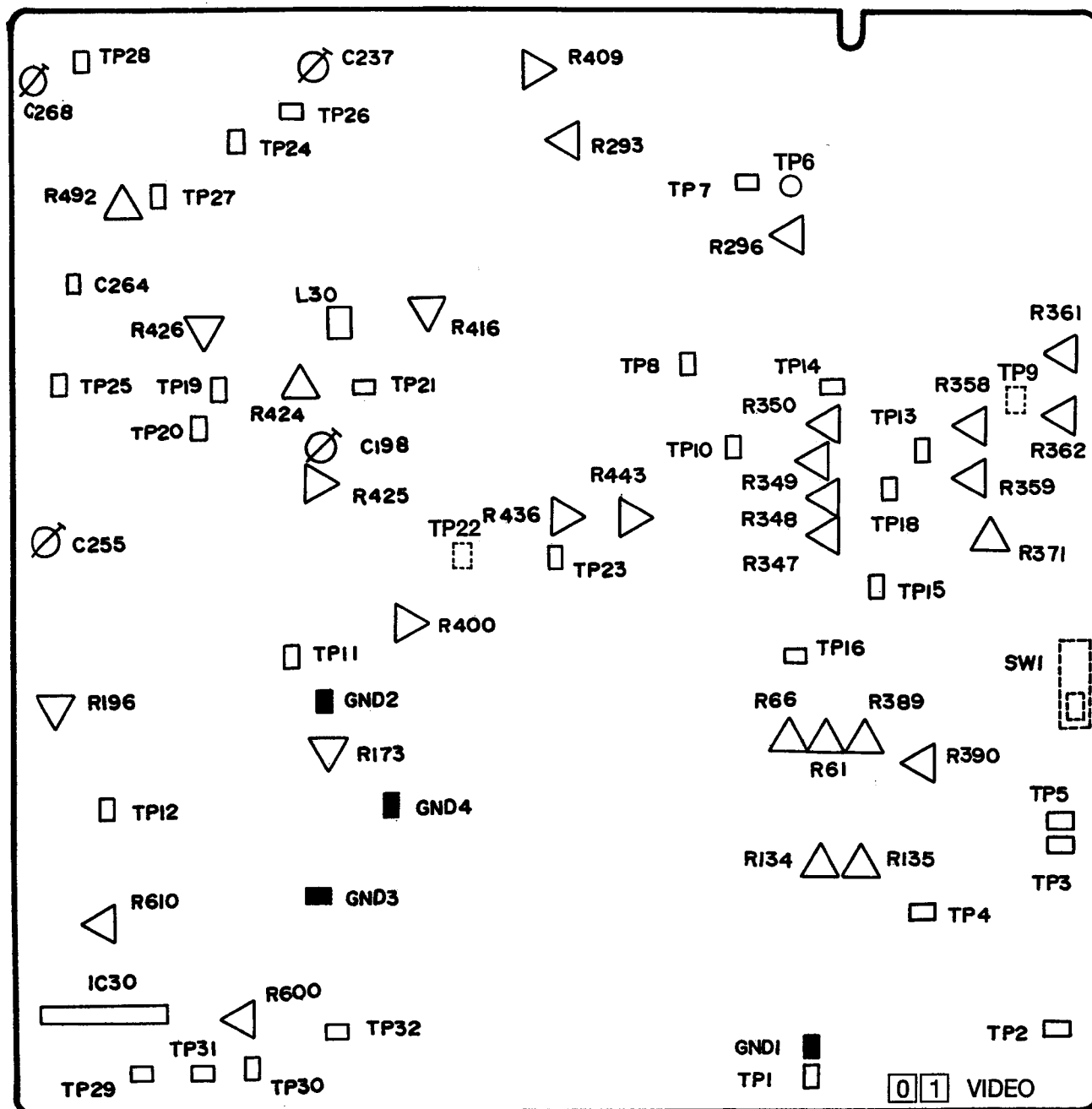
TP2 (GND)

TP1

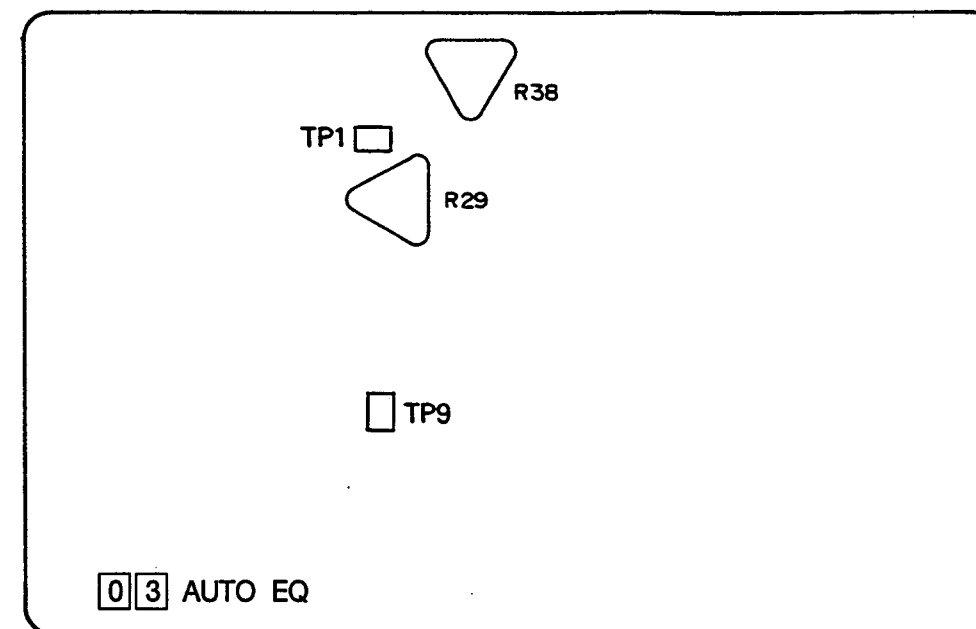
TP13

05 S/S

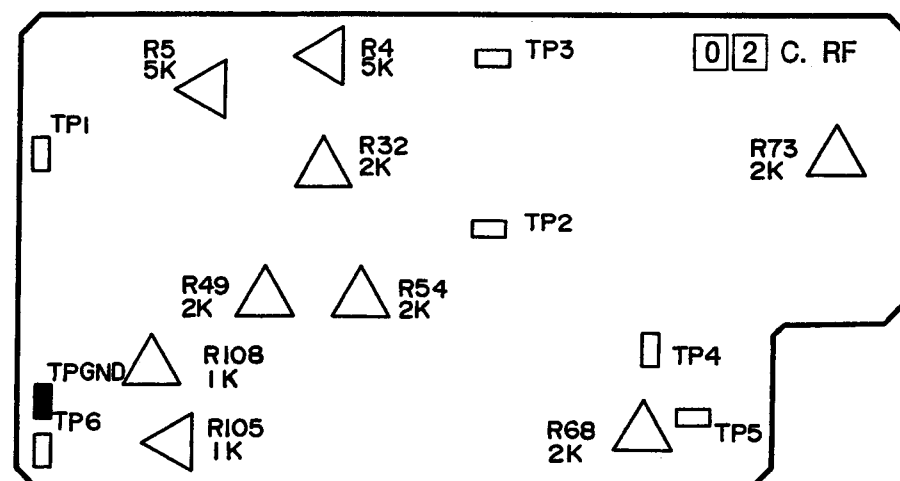
— VIDEO —



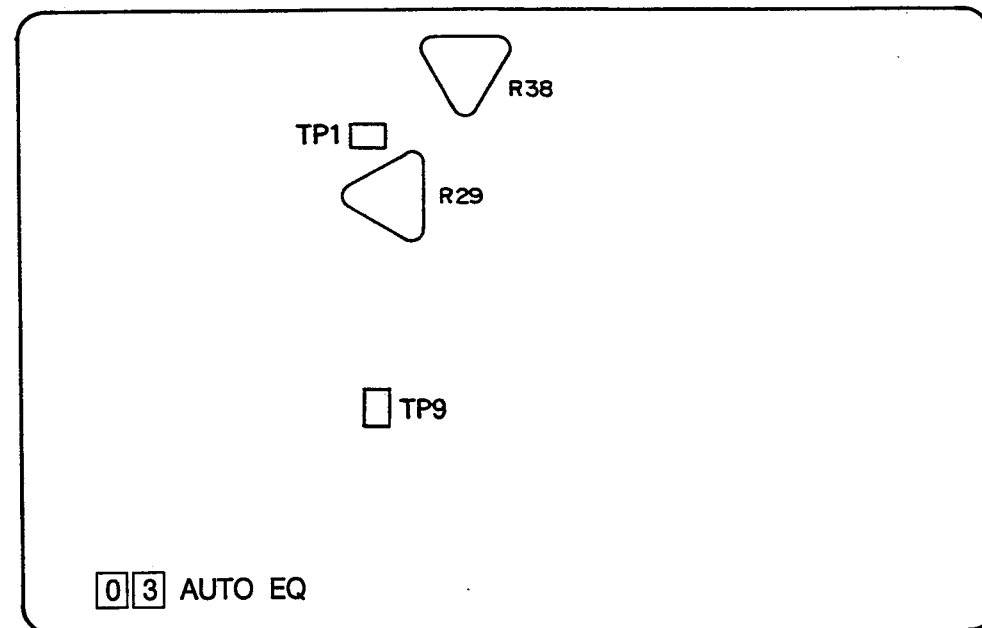
— AUTO EQ —

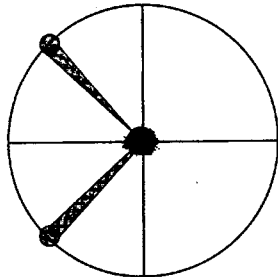
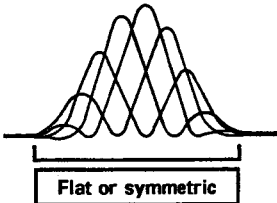
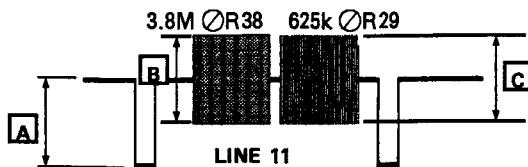


— C. RF —



— AUTO EQ —



No.	Item	Check point	Adjustment	Signal	Mode	Check and Adjustment
22	PB color level	Y/C 443 C OUT (75Ω terminator)	R409[0][1]	Color bar ↓ Y/C 443 IN (CAMERA ADAPTER)	REC S-VHS ↓ PB	(1) Input the EBU color bar signal directly to the vectorscope while adjusting the GAIN control so that the burst level crosses the scope's circumference. (2) With the vectorscope connected with the C OUT, record in the S-VHS mode and play it back. (3) Adjust R409 so that the burst level is the same as in the step (1).
		VIDEO OUT (75Ω terminator)	R400[0][1]		REC VHS ↓ PB	(4) With the vectorscope connected with the VIDEO OUT, record in the VHS mode and play it back. (5) Adjust R400 so that the burst level is the same as in the step (1).
<div></div> <div>Adjust to equalize level of the luminous point of the burst signal (+135°) with the level of the EBU color bar signal.</div>						
23	PB Y/C delay	VIDEO OUT (75Ω terminator)	R443[0][1]	Pulse & bar ↓ Y/C 443 IN (CAMERA ADAPTER)	REC S-VHS ↓ PB	(1) Record the pulse & bar signal in the S-VHS mode and play it back. (2) Adjust R443 so that the modulated 20T pulse waveform is symmetric in the base.
			R436[0][1]		REC VHS ↓ PB	(3) Record the pulse & bar signal in the VHS mode and play it back. (4) Adjust R436 so that the modulated 20T pulse waveform is symmetric in the base.
<div></div> <div>Flat or symmetric</div>						
24	AUTO EQ	TP6[0][1]	R38[0][3] R29[0][3]	Color bar ↓ Y/C 443 IN (CAMERA ADAPTER)	REC S-VHS	(1) Confirm that the DIP SW of the AUTO EQ board is set as follows. SW1-1 : ON SW1-2 : ON SW1-3 : ON SW1-4 : OFF. (2) Observe the AUTO EQ signal is output the 11th line. (3) Adjust the sync level (A) and the 3.8 MHz signal level (B) with R38 while adjust the 625 kHz signal level with R29 so that ratio between A, B and C is 4 : 2 : 4. A : B : C = 4 : 2 : 4
<div></div> <div>A : B : C = 4 : 2 : 4</div>						

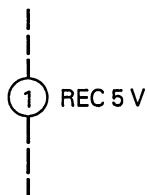
SECTION 4 DIAGRAM AND CIRCUIT BOARDS

4.1 FOREWORD

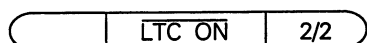
4.1.1 Expression of wiring

Wiring is expressed in four ways.

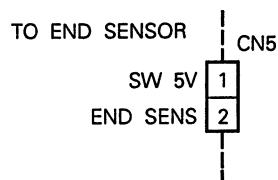
- 1) Wiring on the same board.



- 2) Wiring on the same board.



- 3)



- 4) Expression of connectors in the overall wiring diagram and the Mother board circuit diagram.

The following illustrates "CN9 pin 1, 2, 3 and 4".

CN9	
AL 12V	01
AL 12V	02
GND	03
GND	04

4.1.2 Signal flow on the diagram

The following arrow marks indicate the specified signal parts respectively.

- ➡ : RECORDING or E-E SIGNAL PATH
- ⇨ : PLAYBACK SIGNAL PATH
- ⇨ : REC/PLAY SIGNAL PATH

4.1.3 Measurement of voltage and waveform

- 1) Voltage

Measured by digital voltmeter both in the S-VHS REC and S-VHS PLAY BACK mode.

- 2) Waveform

VIDEO: Unless otherwise indicated, (a) color bars signal input through Y/C 443 IN terminal of the CAMERA ADAPTER in REC, (b) color bars signal in PB.

Note: Indicated voltage were measured as directly at respective pins of semiconductors and connectors.

4.1.4 Unit of value

Unless otherwise specified:

- 1) Resistance is in Ω (1/6 W, 1/8 W).
- 2) Capacitance in μF .
- 3) Inductance in μH .
- 4) All diodes are 1SS133.
- 5) Parts with the asterisk (*) are not used in this model.

4.1.5 Circuit board locations

Board No.	Board Name	Page of diagram			
		Block diagram	Schematic diagram	Circuit board	Parts list
01	VIDEO (Includ 29 DL)	4-6	4-10,11,12	4-13, 14	6-1(11)
02	C. RF	4-6	4-16	4-17	6-12
03	A. EQ	4-6	4-18	4-19	6-14
04	PRE/REC	—	4-20	4-21	6-15
05	SYSCON/SERVO	4-8, 9	4-28	4-29	6-17
06	REGULATOR	—	4-32	4-33	6-20
07	AUDIO	4-7	4-24, 25	4-26, 27	6-22
08	LCD	—	4-37	—	6-28
09	TIME CODE (SA-R200E)	—	4-38	4-39	2 (SA-R200E)
10	MOTHER	—	4-5	4-4	6-29
11	PRE/REC JUNC	—	4-22	4-22	6-29
14	POWER CTL (Includ POWER CTL SUB)	—	4-23	4-23	6-30
15	CONNECTOR	—	4-5	4-35	6-30
16	50PIN CONNECTOR	—	4-30	4-30	6-30
17	MODE SENSOR	4-8	4-5	4-35	6-31
18	OPERATION	—	4-31	4-31	6-31
19	MDA	—	4-34	4-35	6-31
20	MECHA IF	4-8	4-36	4-35	6-32
21	MECHA JUNC	—	4-36	4-35	6-32
22	END SENSOR	4-8	4-5	4-35	6-32
23	START SENSOR	4-8	4-5	4-35	6-32
24	MDA JUNC	—	4-5	4-35	6-33
25	POWER SW	—	4-5	4-35	6-33
26	A/C HEAD	—	4-5	4-35	6-33
35	REEL SENSOR	4-8	4-5	4-35	6-33

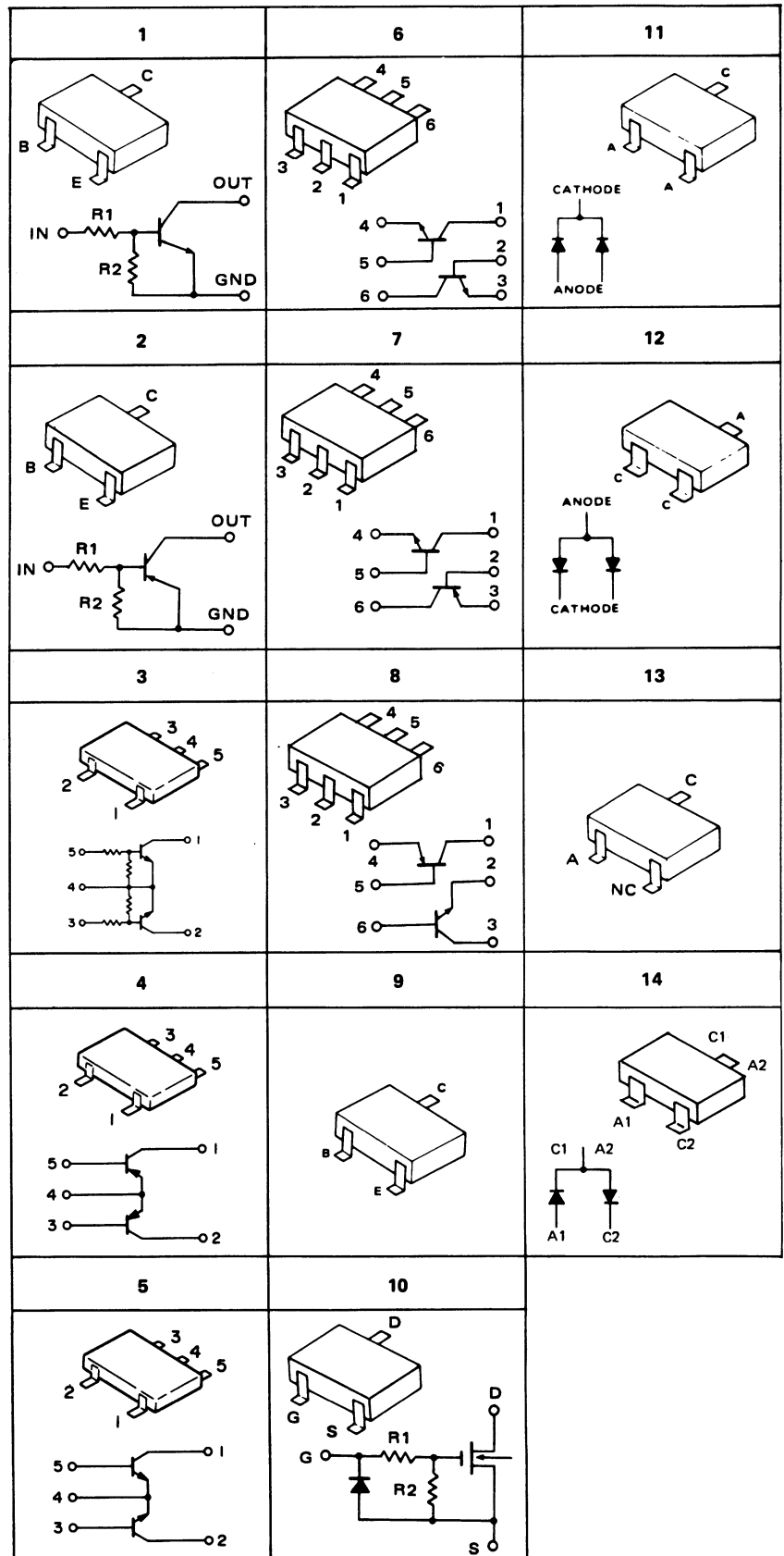
4.1.6 Shapes of transistor & diodes

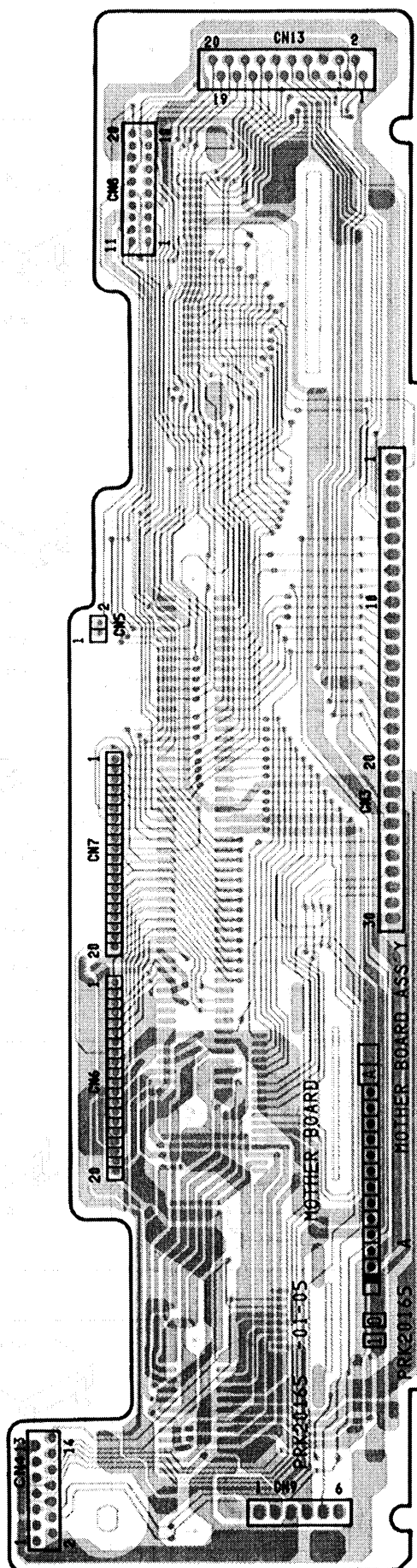
• Transistors

DTA124EK	2
DTA144EK	2
DTC114EK	1
DTC114YK	1
DTC144EK	1
DTC144EU	1
FMG2	3
FMS1	4
FMW1	5
IMX1	6
IMZ1	7
IMZ2	8
2SA1022C	9
2SB709	9
2SC2412K	9
2SC2778	9
2SC4081	9
2SD601/A	9
2SD602/A	9
2SK621	10

• Diodes

DAN202K	11
DAP202K	12
DA204K	14
MA28WA	13
MA3056	13
MA3075	13





6

4.3 OVERALL WIRING DIAGRAM

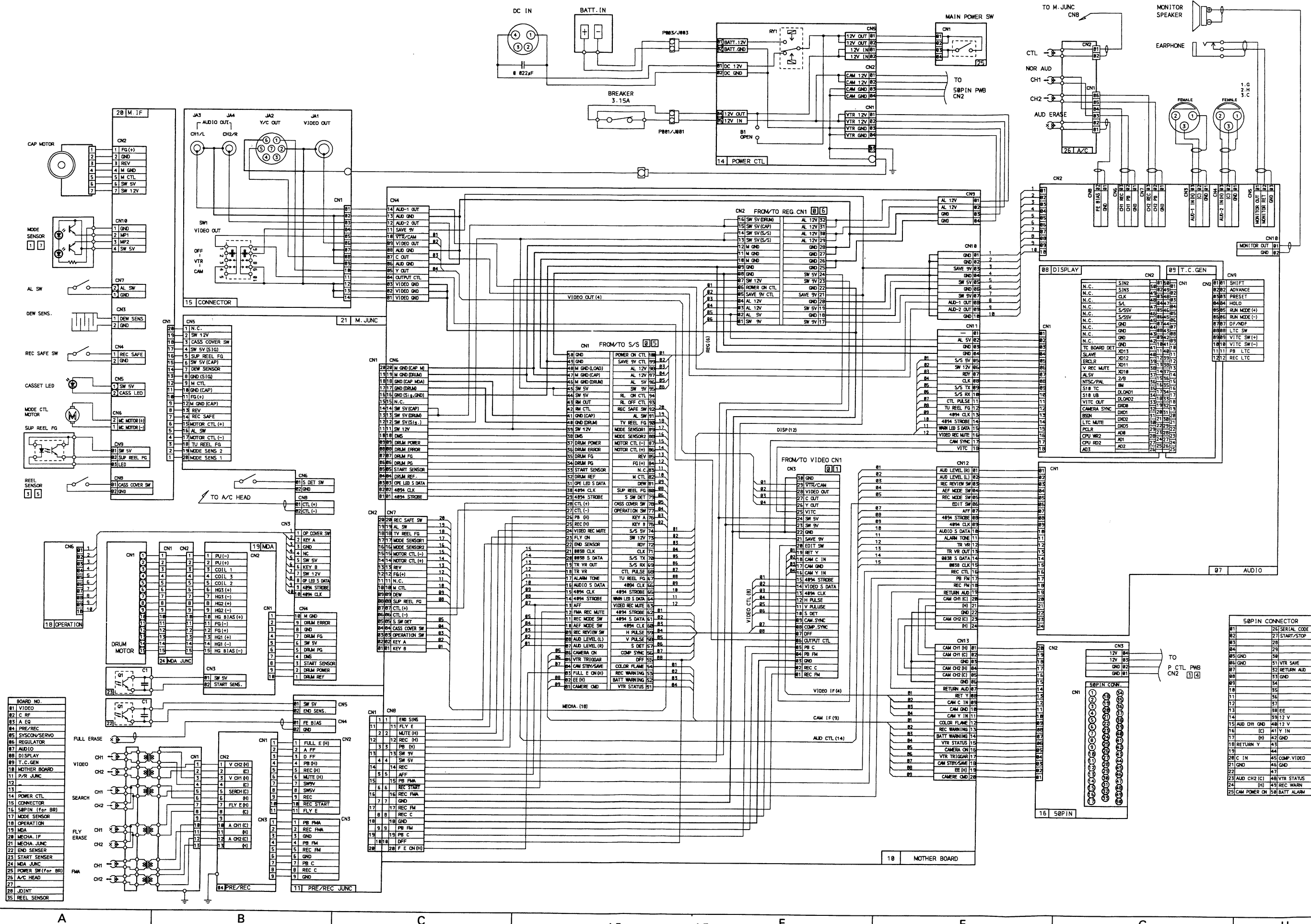
5

4

3

2

1



4-5

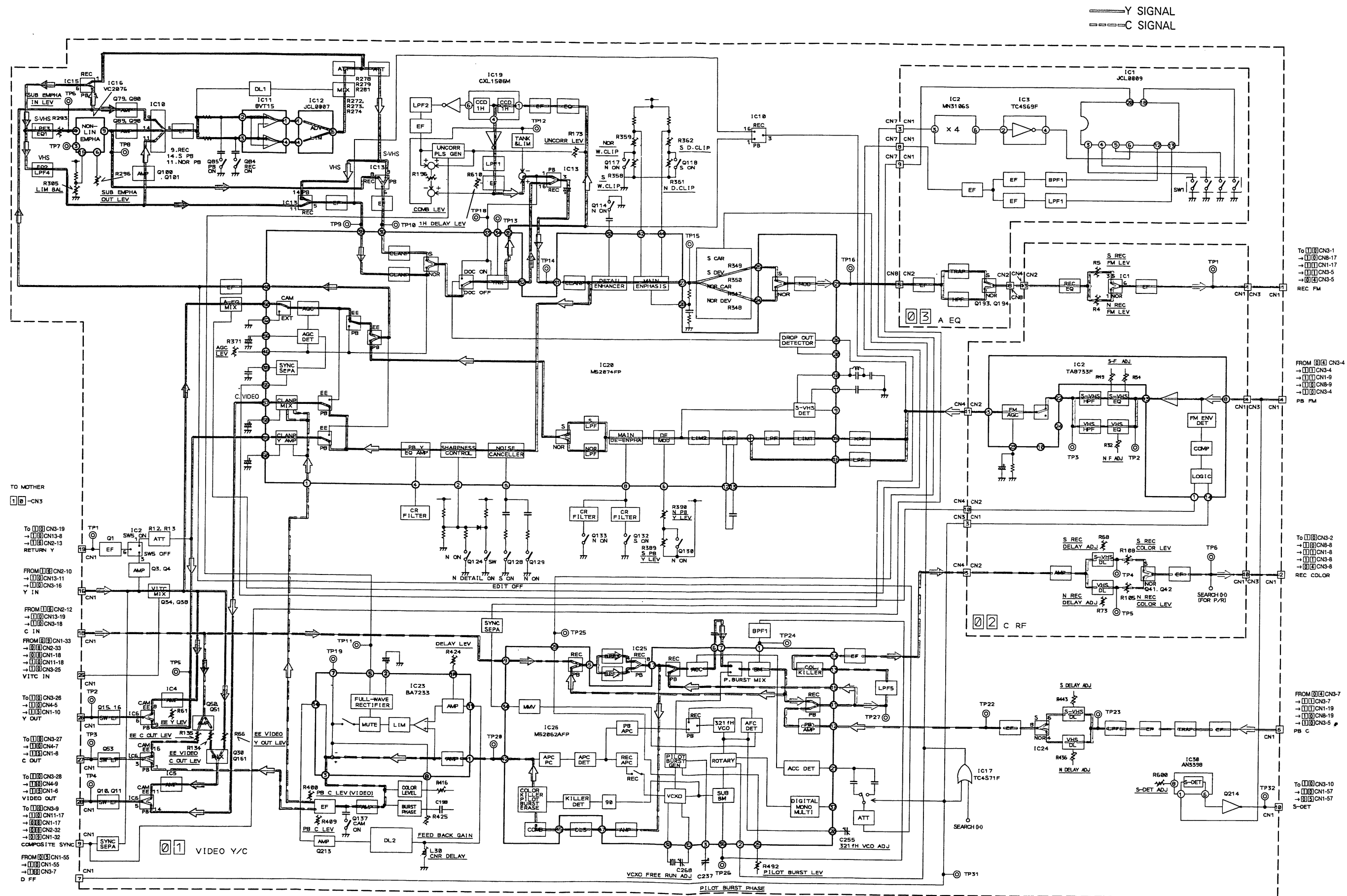
4-5

E

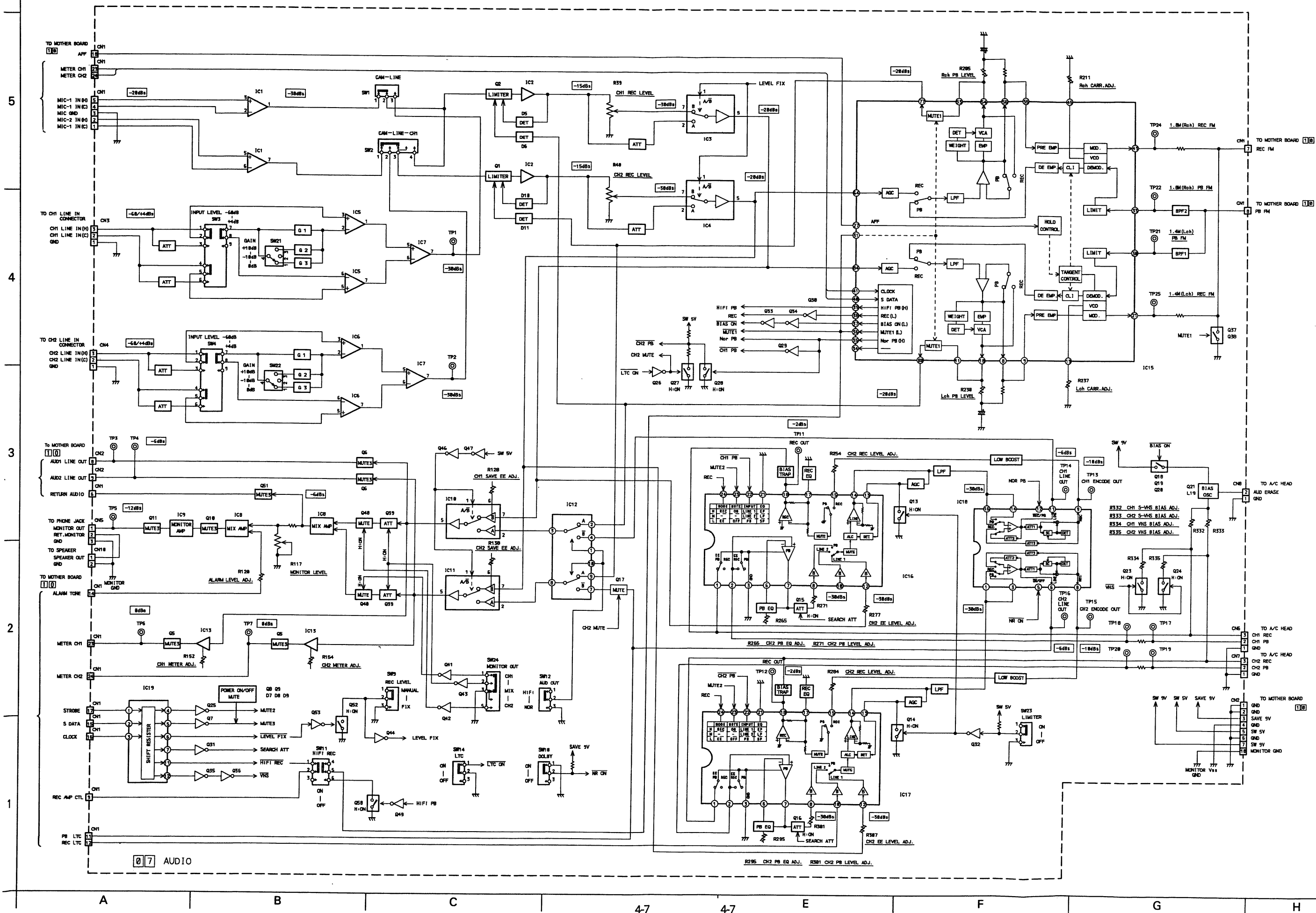
F

G

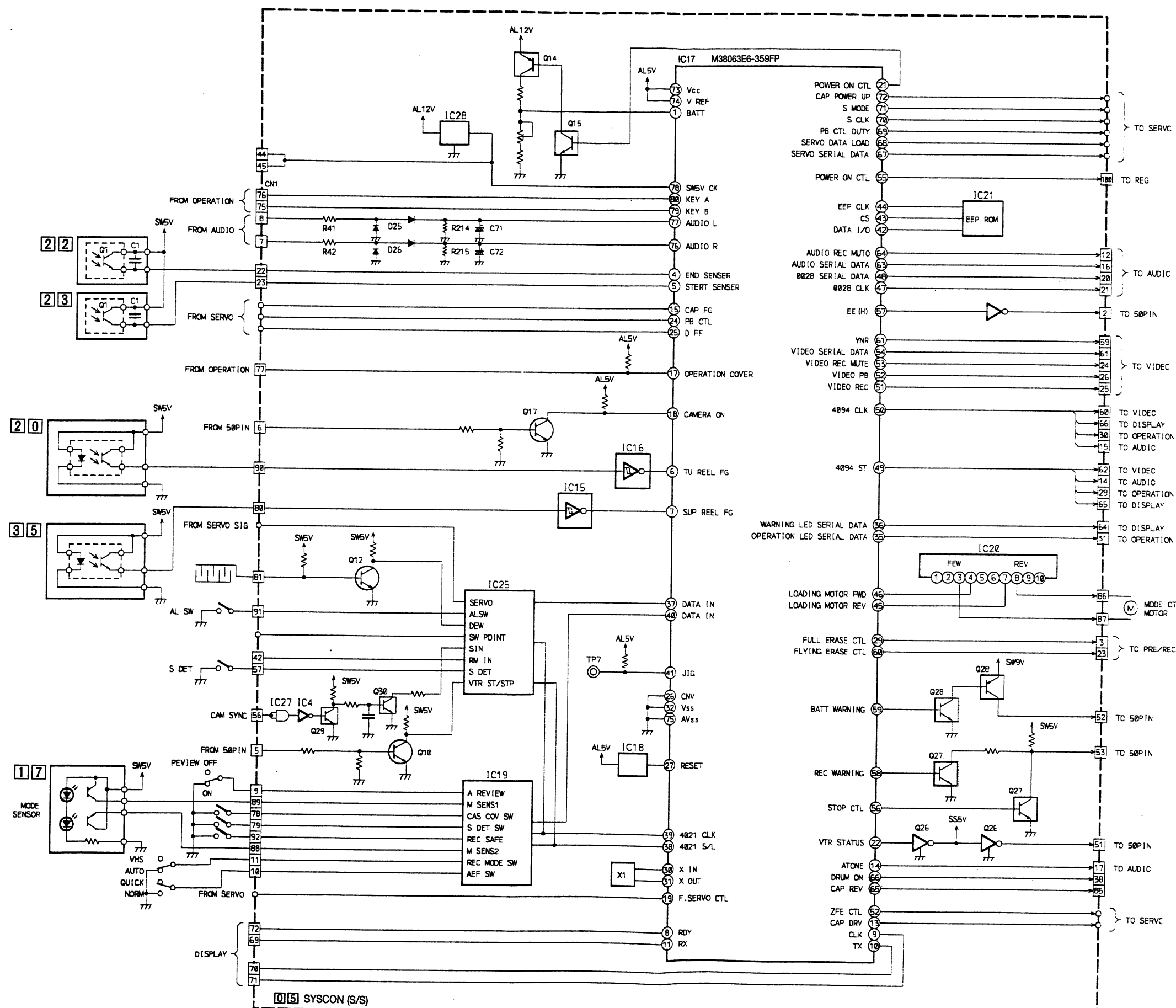
H



4.5 AUDIO BLOCK DIAGRAM

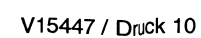


4.6 SYSCON/SERVO BLOCK DIAGRAM (1/2)

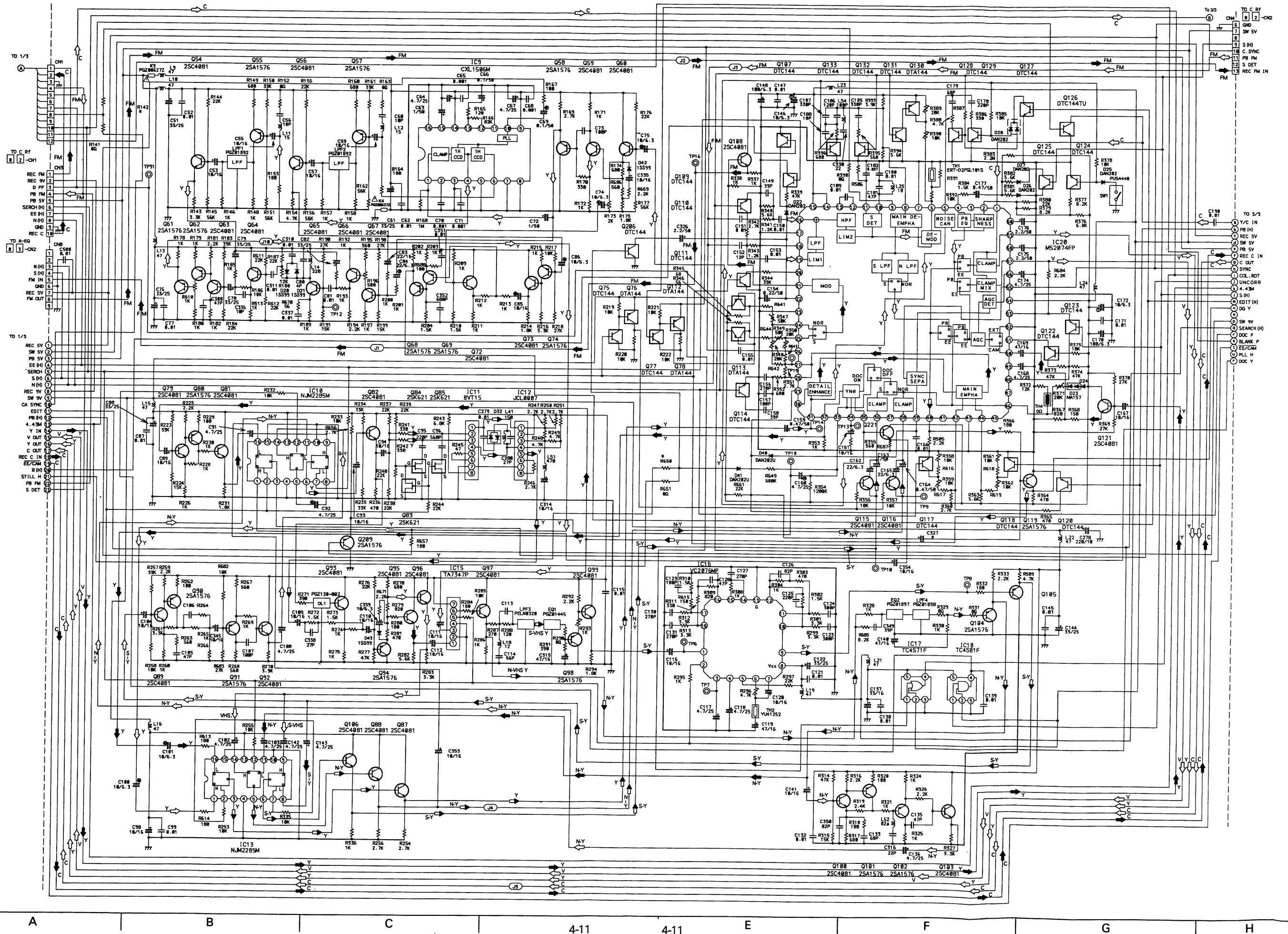




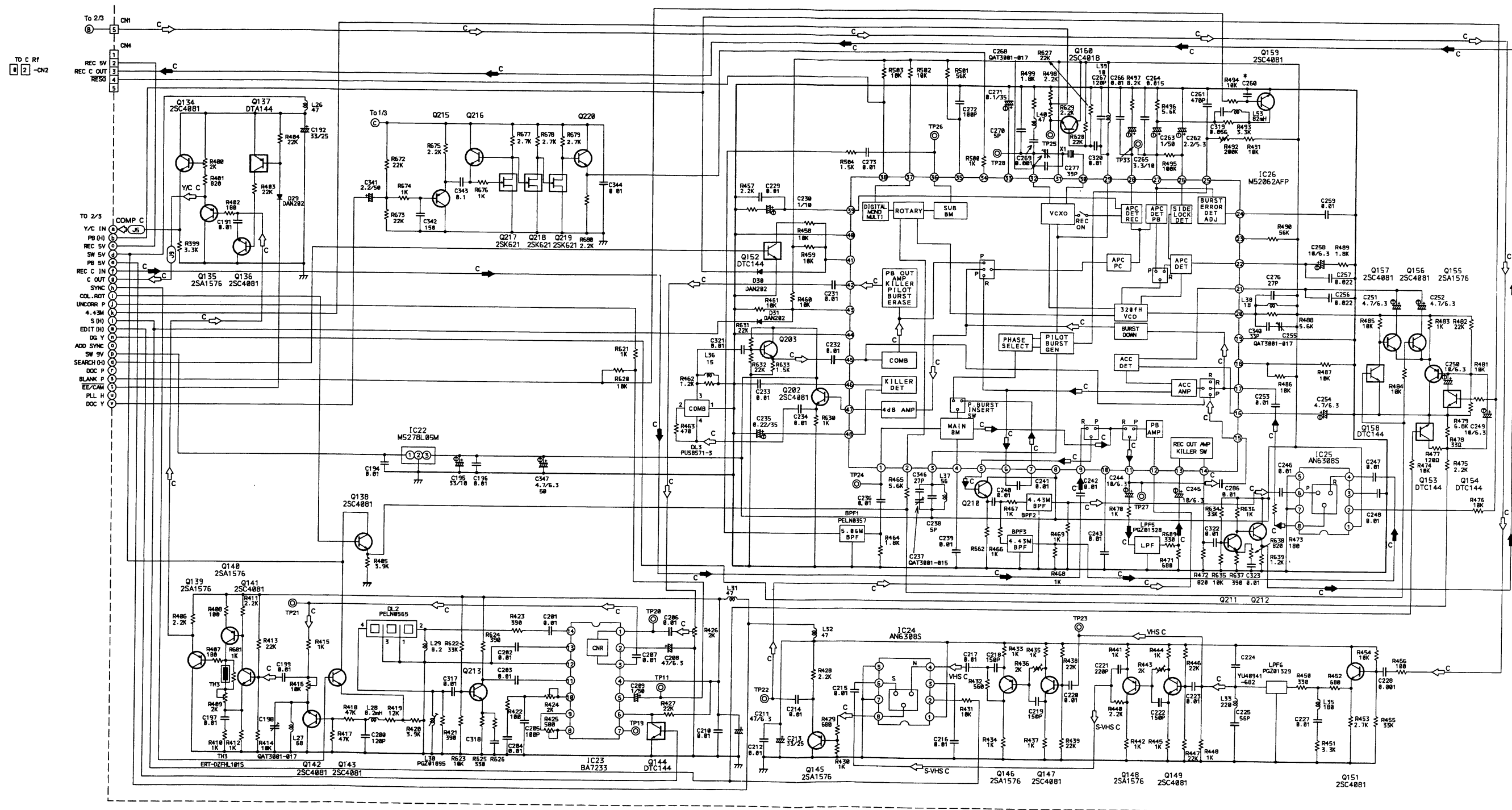
INPUT/OUTPUT PROCESS



Y PROCESS



C PROCESS



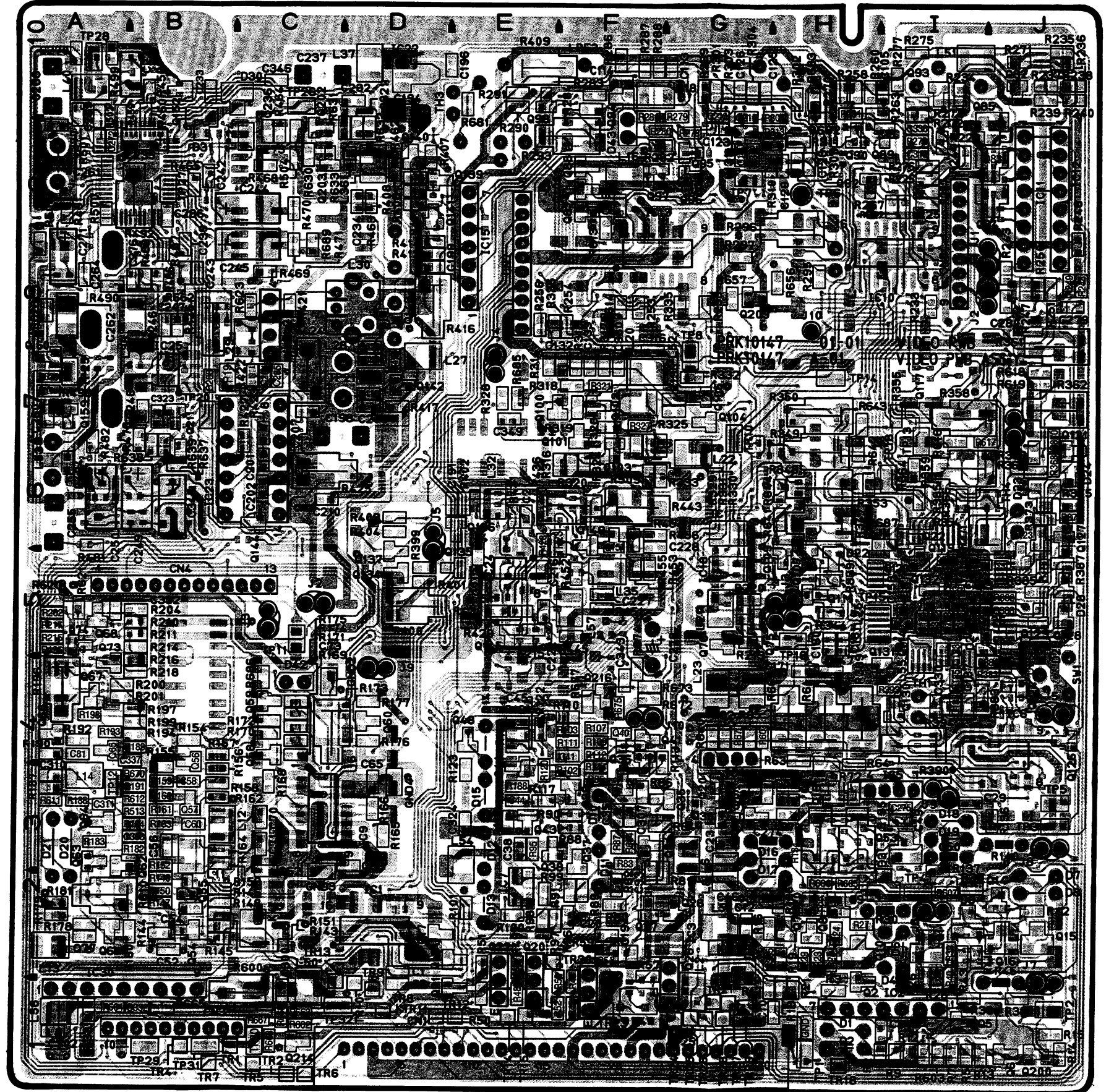
4.8 VIDEO CIRCUIT BOARD

— SOLDER SIDE —

PRK10147A-01 VIDEO PWB ASSY

PRK10147-01-01 VIDEO PWB

TP1	TP2	TP3	TP4	TP5
H-rate REC/PB 1.0 Vp-p	H-rate REC/PB 2.0 Vp-p	H-rate REC/PB 1.5 Vp-p	H-rate REC/PB 1.0 Vp-p	H-rate REC 2.0 Vp-p PB 1.7 Vp-p
TP6	TP8		TP9	
H-rate REC/PB 0.4 Vp-p	H-rate REC 0.5 Vp-p	H-rate PB 0.6 Vp-p	H-rate REC 0.45 Vp-p PB 0.4 Vp-p	
TP10		TP11	TP12	
H-rate REC 0.5 Vp-p	H-rate PB 0.42 Vp-p	V-rate PB 0.7 Vp-p	V-rate PB 0.4 Vp-p	
TP13		TP14		
H-rate REC 0.25 Vp-p	V-rate PB 0.3 Vp-p	H-rate REC 0.28 Vp-p	H-rate PB 0.25 Vp-p	
TP15	TP16	TP18	TP19	TP20
H-rate REC 0.8 Vp-p (Pulse & bar)	REC 1.2 Vp-p PB 0.16 Vp-p	H-rate PB 0.25 Vp-p	H-rate PB 0.08 Vp-p	H-rate REC 0.4 Vp-p PB 0.3 Vp-p
TP21	TP22	TP23	TP24	TP25
H-rate PB 0.45 Vp-p	H-rate PB 48 mVp-p	H-rate PB 0.11 Vp-p	REC/PB 0.175 Vp-p (5.06 MHz)	REC/PB 1.5 Vp-p (4.43 MHz)
TP26	TP27	TP28	TP29	TP31
REC/PB 0.9 Vp-p	H-rate REC 1.2 Vp-p PB 0.2 Vp-p	REC/PB 0.45 Vp-p (4.43 MHz)	V-rate PB 0.1 Vp-p	REC/PB 5 Vp-p (25 Hz)



6

5

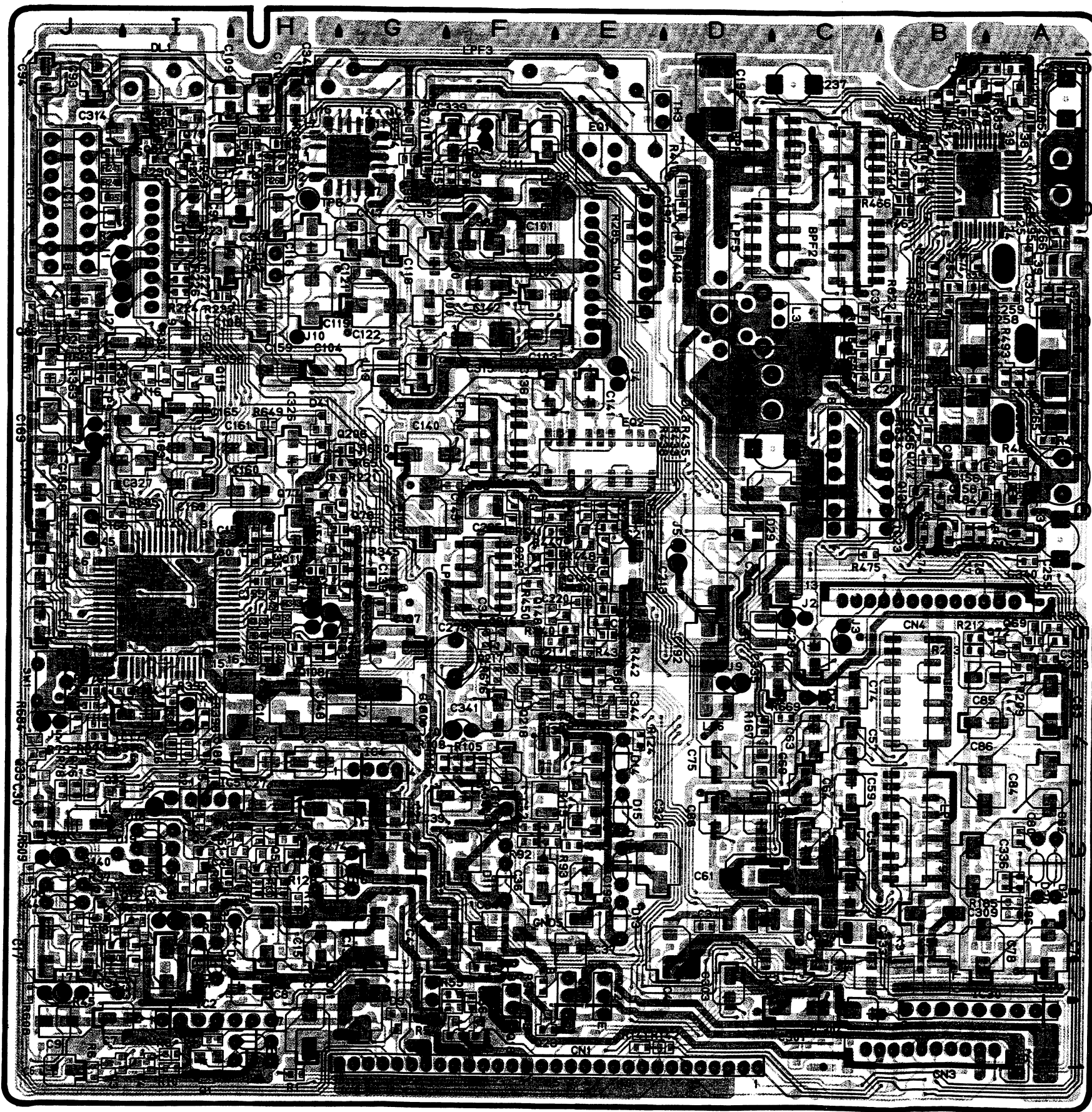
4

3

2

1

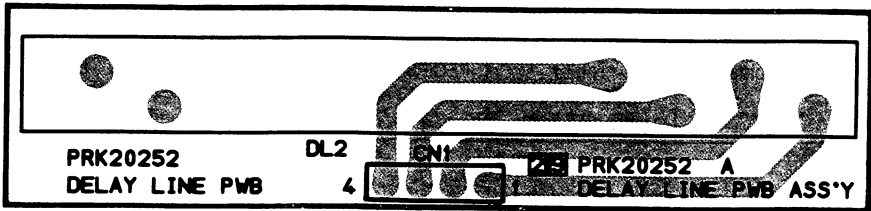
— PARTS SIDE —



V I D E O

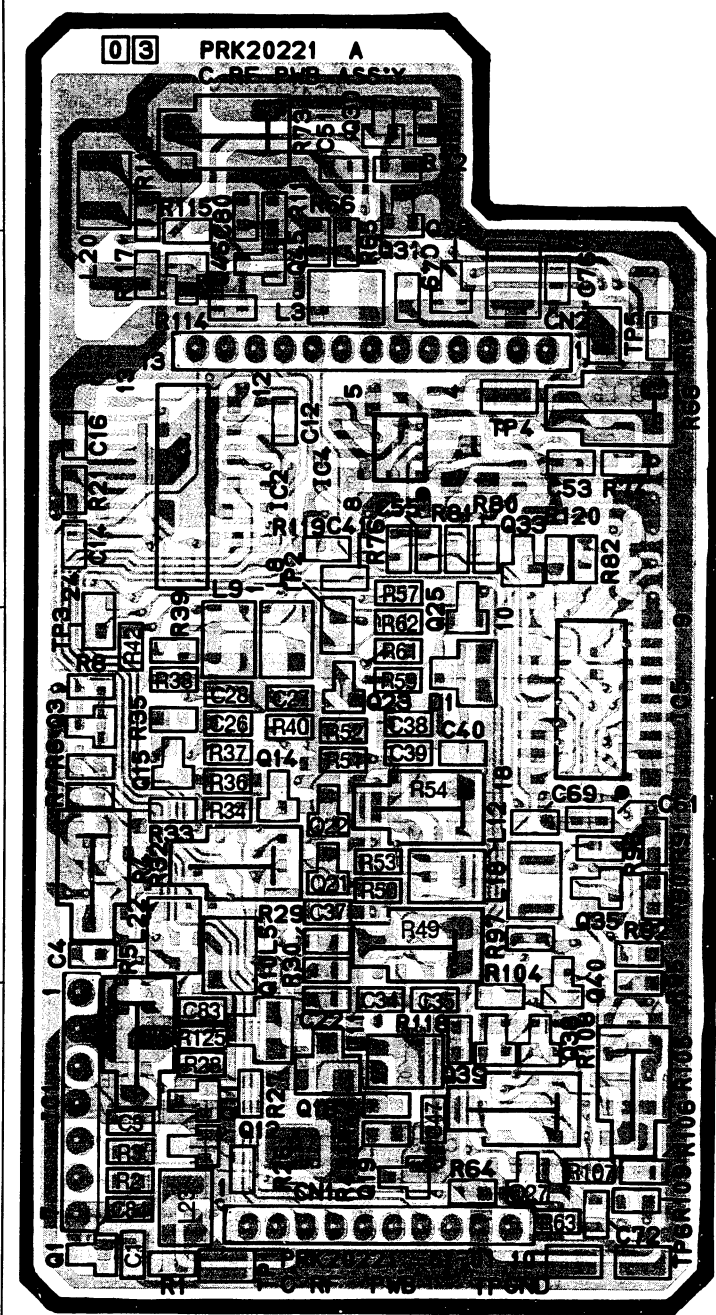
SYMBOL No.	REC	PB	SYMBOL No.	REC	PB	SYMBOL No.	REC	PB	SYMBOL No.	REC	PB
INTEGRATED CIRCUIT			IC10	1	4.5	IC20	1	4.5	IC25	1	5.0
IC1	1	0.0	IC11	1	7.0				IC26	1	Not measured
IC2	1	0.0	IC12	1	7.0						
IC3	1	0.0	IC13	1	4.5						
IC4	1	0.0	IC15	1	0.0	IC22	1	0.0			
IC5	1	0.0	IC16	1	2.9	IC23	1	0.0	TRANSISTOR		
IC6	1	4.5	IC17	1	5.2	IC24	1	0.0	Q1	1	5.4
IC7	1	0.0	IC18	1	4.4				Q2	1	4.7
IC8	1	4.7							Q3	1	5.2
IC9	1	0.0							Q4	1	4.4
									Q5	1	5.0

— DL BOARD —

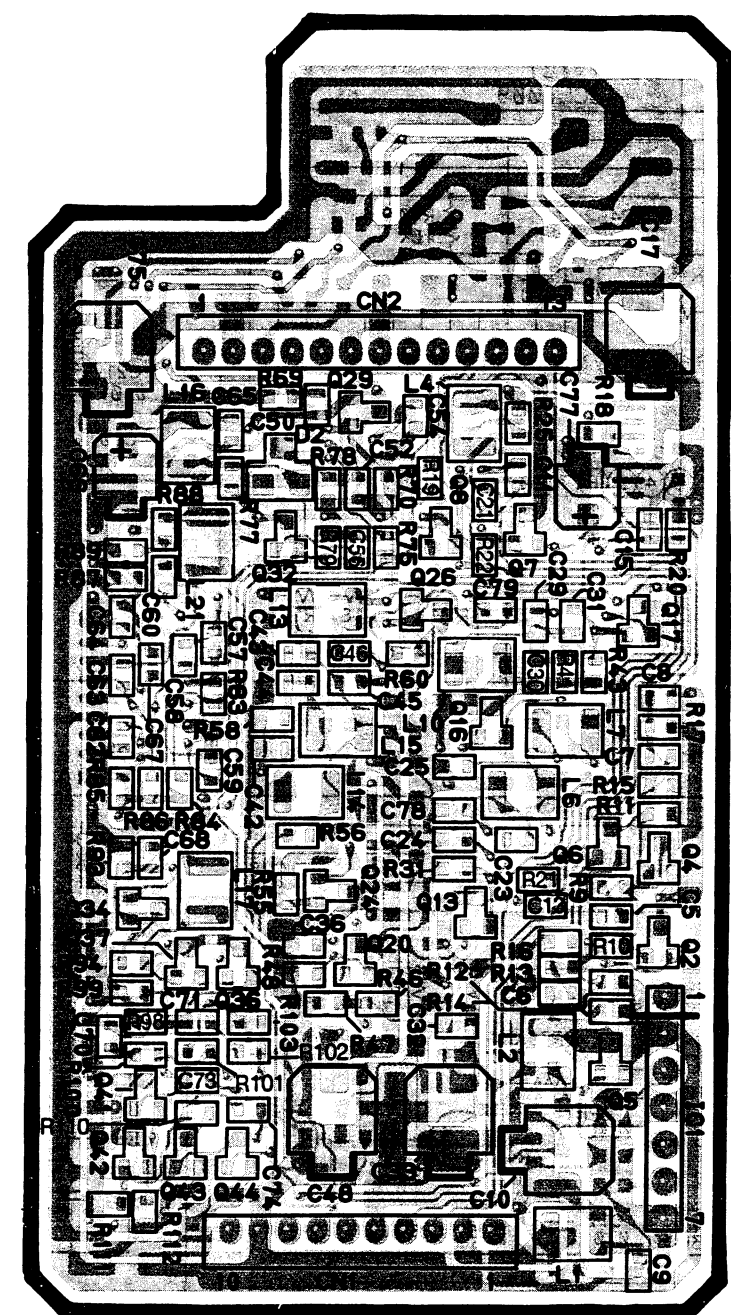


SYMBOL No.	REC	PB	SYMBOL No.	REC	PB	SYMBOL No.	REC	PB	SYMBOL No.	REC	PB	SYMBOL No.	REC	PB	SYMBOL No.	REC	PB	SYMBOL No.	REC	PB	SYMBOL No.	REC	PB	SYMBOL No.	REC	PB	SYMBOL No.	REC	PB	SYMBOL No.	REC	PB	SYMBOL No.	REC	PB									
Q6	B	1.7 2.3	Q28	B	5.0 0.0	Q50	B	2.2 1.6	Q74	B	0.0 0.2	Q96	B	8.0 7.4	Q118	B	4.6 0.0	Q140	B	0.2 0.2	Q201	B	4.8 4.2	Q28	B	5.0 0.0	Q50	B	2.2 1.6	Q74	B	0.0 0.2	Q96	B	8.0 7.4	Q118	B	4.6 0.0	Q140	B	0.2 0.2	Q201	B	4.8 4.2
Q7	B	3.9 3.3	Q29	B	5.2 0.8	Q51	B	6.1 0.7	Q75	B	0.0 0.0	Q97	B	5.1 4.5	Q119	B	1.7 2.4	Q141	B	0.0 0.0	Q202	B	2.4 1.8	Q29	B	5.2 0.8	Q51	B	6.1 0.7	Q75	B	0.0 0.0	Q97	B	5.1 4.5	Q119	B	1.7 2.4	Q141	B	0.0 0.0	Q202	B	2.4 1.8
Q8	B	3.9 3.3	Q30	B	1.5 2.2	Q52	B	3.9 4.6	Q76	B	8.9 0.0	Q98	B	4.5 0.1	Q120	B	0.2 0.0	Q142	B	0.0 0.0	Q203	B	2.4 1.8	Q30	B	1.5 2.2	Q52	B	3.9 4.6	Q76	B	8.9 0.0	Q98	B	4.5 0.1	Q120	B	0.2 0.0	Q142	B	0.0 0.0	Q203	B	2.4 1.8
Q9	B	3.9 4.9	Q31	B	2.2 2.8	Q53	B	4.3 3.6	Q77	B	0.0 0.0	Q99	B	5.6 5.0	Q121	B	2.5 1.8	Q143	B	0.4 0.3	Q206	B	0.0 0.0	Q31	B	2.2 2.8	Q53	B	4.3 3.6	Q77	B	0.0 0.0	Q99	B	5.6 5.0	Q121	B	2.5 1.8	Q143	B	0.4 0.3	Q206	B	0.0 0.0
Q10	B	4.9 4.2	Q32	B	5.1 5.0	Q54	B	0.1 0.0	Q78	B	0.0 5.2	Q100	B	2.1 1.6	Q122	B	4.1 0.0	Q144	B	0.0 0.0	Q207	B	0.3 0.0	Q32	B	5.1 5.0	Q54	B	0.1 0.0	Q78	B	0.0 5.2	Q100	B	2.1 1.6	Q122	B	4.1 0.0	Q144	B	0.0 0.0	Q207	B	0.3 0.0
Q11	B	1.7 1.0	Q33	B	1.6 2.3	Q55	B	0.0 0.2	Q79	B	7.7 2.1	Q101	B	7.9 8.5	Q123	B	4.5 0.0	Q145	B	0.0 0.2	Q208	B	5.0 4.4	Q33	B	1.6 2.3	Q55	B	0.0 0.2	Q79	B	7.7 2.1	Q101	B	7.9 8.5	Q123	B	4.5 0.0	Q145	B	0.0 0.2	Q208	B	5.0 4.4
Q12	B	4.0 3.8	Q34	B	5.2 4.6	Q56	B	0.1 0.0	Q80	B	7.9 8.5	Q102	B	6.0 6.7	Q124	B	2.5 0.0	Q146	B	0.0 0.2	Q209	B	0.2 0.9	Q34	B	5.2 4.6	Q56	B	0.1 0.0	Q80	B	7.9 8.5	Q102	B	6.0 6.7	Q124	B	2.5 0.0	Q146	B	0.0 0.2	Q209	B	0.2 0.9
Q13	B	3.9 3.3	Q35	B	4.3 4.9	Q57	B	0.1 0.0	Q81	B	3.9 3.3	Q103	B	6.7 6.1	Q125	B	4.6 0.0	Q147	B	0.0 0.0	Q210	B	Not measured	Q35	B	4.3 4.9	Q57	B	0.1 0.0	Q81	B	3.9 3.3	Q103	B	6.7 6.1	Q125	B	4.6 0.0	Q147	B	0.0 0.0	Q210	B	Not measured
Q14	B	5.4 4.8	Q36	B	6.0 4.2	Q58	B	0.0 0.2	Q82	B	4.0 2.4	Q104	B	4.5 5.1	Q126	B	0.0 4.9	Q148	B	0.2 0.0	Q211	B	1.1 0.5	Q36	B	6.0 4.2	Q58	B	0.0 0.2	Q82	B	4.0 2.4	Q104	B	4.5 5.1	Q126	B	0.0 4.9	Q148	B	0.2 0.0	Q211	B	1.1 0.5
Q15	B	4.9 4.2	Q37	B	3.6 3.0	Q59	B	0.0 0.2	Q83	G	0.2 4.1	Q105	B	1.5 2.1	Q127	B	0.0 3.6	Q149	B	0.0 0.2	Q212	B	Not measured	Q37	B	3.6 3.0	Q59	B	0.0 0.															

— SOLDER SIDE —



— PARTS SIDE —



C RF <02>

SYMBOL No.		REC	PB	SYMBOL No.		REC	PB	SYMBOL No.		REC	PB	SYMBOL No.		REC	PB														
INTEGRATED CIRCUIT																													
IC1	1	2	6.0	—	Q2	B	Not measured		Q20	B	Not measured		Q37	B	Not measured														
	3	0.0	0.0	Q3		B	1.2	0.0		Q21	B	0.0		2.1	Q38	B	2.4	0.2											
	4	0.0	0.0			Q4	B	0.0			0.0	Q22		B		0.0	0.0	Q39	B	4.9	0.4								
	5	0.0	0.8				Q5	B			1.9			0.0		Q23	B		0.0	0.0	Q40	B	1.8	0.0					
	6	0.0	0.0					Q6			B			Not measured			Q24		B	0.0		3.5	Q41	B	2.4	0.4			
	7	0.1	Q7								B			Not measured					Q25	B		0.0		2.6	Q42	B	4.9	0.4	
	8	0.0									Q8			B						Not measured		Q26		B		0.0	0.0	Q43	B
9	0.0	Q9	B	Not measured		Q27	B	0.0	0.0	Q44		B	0.0	0.0															
10	0.0		Q10	B	0.2		5.0	Q28	B		0.3	0.0	Q45	B	0.0	0.0													
11	0.0	Q11		B	0.0	5.1	Q29		B	0.0	0.0	Q46		B	0.0	0.0													
12	0.0		Q12	B	0.2	0.0		Q30	B	1.5	0.4		CONNECTOR																
13	0.0	Q13		B	0.0	0.0	Q31		B	4.0	0.0	CN1	1	0.1	-0.3														
14	0.0		Q14	B	4.5	4.4		Q32	B	0.9	0.0		CN2	2	0.8	0.1													
15	0.0	Q15		B	0.0	0.0	Q33		B	4.0	0.4			3	0.0	0.0													
16	0.0		Q16	B	0.0	0.0		Q34	B	3.3	0.0				4	0.2	0.0												
17	0.0	Q17		B	0.0	0.0	Q35		B	Not measured						5	0.0	0.0											
18	0.0		Q18	B	0.0	0.0		Q36	B	2.4	0.0						6	0.0	0.0										
19	0.0	Q19		B	0.0	0.0	Q37		B	4.9	0.0							7	0.0	0.0									
20	0.0		Q20	B	0.0	0.0		Q38	B	1.7	0.0	8	0.0	0.0															
21	0.0	Q21		B	0.0	0.0	Q39		B	0.0	0.0		9	0.0	0.0														
22	0.0		Q22	B	0.0	0.0		Q40	B	0.0	0.0	10		0.0	0.0														
23	0.0	Q23		B	0.0	0.0	Q41		B	0.0	0.0		11	0.0	0.0														
24	0.0		Q24	B	0.0	0.0		Q42	B	0.0	0.0	12		0.0	0.0														
25	0.0	Q25		B	0.0	0.0	Q43		B	0.0	0.0		13	0.0	0.0														
26	0.0		Q26	B	0.0	0.0		Q44	B	0.0	0.0	14		0.0	0.0														
27	0.0	Q27		B	0.0	0.0	Q45		B	0.0	0.0		15	0.0	0.0														
28	0.0		Q28	B	0.0	0.0		Q46	B	0.0	0.0	16		0.0	0.0														
29	0.0	Q29		B	0.0	0.0	Q47		B	0.0	0.0		17	0.0	0.0														
30	0.0		Q30	B	0.0	0.0		Q48	B	0.0	0.0	18		0.0	0.0														
31	0.0	Q31		B	0.0	0.0	Q49		B	0.0	0.0		19	0.0	0.0														
32	0.0		Q32	B	0.0	0.0		Q50	B	0.0	0.0	20		0.0	0.0														
33	0.0	Q33		B	0.0	0.0	Q51		B	0.0	0.0		21	0.0	0.0														
34	0.0		Q34	B	0.0	0.0		Q52	B	0.0	0.0	22		0.0	0.0														
35	0.0	Q35		B	0.0	0.0	Q53		B	0.0	0.0		23	0.0	0.0														
36	0.0		Q36	B	0.0	0.0		Q54	B	0.0	0.0	24		0.0	0.0														
37	0.0	Q37		B	0.0	0.0	Q55		B	0.0	0.0		25	0.0	0.0														
38	0.0		Q38	B	0.0	0.0		Q56	B	0.0	0.0	26		0.0	0.0														
39	0.0	Q39		B	0.0	0.0	Q57		B	0.0	0.0		27	0.0	0.0														
40	0.0		Q40	B	0.0	0.0		Q58	B	0.0	0.0	28		0.0	0.0														
41	0.0	Q41		B	0.0	0.0	Q59		B	0.0	0.0		29	0.0	0.0														
42	0.0		Q42	B	0.0	0.0		Q60	B	0.0	0.0	30		0.0	0.0														
43	0.0	Q43		B	0.0	0.0	Q61		B	0.0	0.0		31	0.0	0.0														
44	0.0		Q44	B	0.0	0.0		Q62	B	0.0	0.0	32		0.0	0.0														
45	0.0	Q45		B	0.0	0.0	Q63		B	0.0	0.0		33	0.0	0.0														
46	0.0		Q46	B	0.0	0.0		Q64	B	0.0	0.0	34		0.0	0.0														
47	0.0	Q47		B	0.0	0.0	Q65		B	0.0	0.0		35	0.0	0.0														
48	0.0		Q48	B	0.0	0.0		Q66	B	0.0	0.0	36		0.0	0.0														
49	0.0	Q49		B	0.0	0.0	Q67		B	0.0	0.0		37	0.0	0.0														
50	0.0		Q50	B	0.0	0.0		Q68	B	0.0	0.0	38		0.0	0.0														
51	0.0	Q51		B	0.0	0.0	Q69		B	0.0	0.0		39	0.0	0.0														
52	0.0		Q52	B	0.0	0.0		Q70	B	0.0	0.0	40		0.0	0.0														
53	0.0	Q53		B	0.0	0.0	Q71		B	0.0	0.0		41	0.0	0.0														
54	0.0		Q54	B	0.0	0.0		Q72	B	0.0	0.0	42		0.0	0.0														
55	0.0	Q55		B	0.0	0.0	Q73		B	0.0	0.0		43	0.0	0.0														
56	0.0		Q56	B	0.0	0.0		Q74	B	0.0	0.0	44		0.0	0.0														
57	0.0	Q57		B	0.0	0.0	Q75		B	0.0	0.0		45	0.0	0.0														
58	0.0		Q58	B	0.0	0.0		Q76	B	0.0	0.0	46		0.0	0.0														
59	0.0	Q59		B	0.0	0.0	Q77		B	0.0	0.0		47	0.0	0.0														
60	0.0		Q60	B	0.0	0.0		Q78	B	0.0	0.0	48		0.0	0.0														
61	0.0	Q61		B	0.0	0.0	Q79		B	0.0	0.0		49	0.0	0.0														
62	0.0		Q62	B	0.0	0.0		Q80	B	0.0	0.0	50		0.0	0.0														
63	0.0	Q63		B	0.0	0.0	Q81		B	0.0	0.0		51	0.0	0.0														
64	0.0		Q64	B	0.0	0.0		Q82	B	0.0	0.0	52		0.0	0.0														
65	0.0	Q65		B	0.0	0.0	Q83		B	0.0	0.0		53	0.0	0.0														
66	0.0		Q66	B	0.0	0.0		Q84	B	0.0	0.0	54		0.0	0.0														
67	0.0	Q67		B	0.0	0.0	Q85		B	0.0	0.0		55	0.0	0.0														
68	0.0		Q68	B	0.0	0.0		Q86	B	0.0	0.0	56		0.0	0.0														
69	0.0	Q69		B	0.0	0.0	Q87		B	0.0	0.0		57	0.0	0.0														
70	0.0		Q70	B	0.0	0.0		Q88	B	0.0	0.0	58		0.0	0.0														
71	0.0	Q71		B	0.0	0.0	Q89		B	0.0	0.0		59	0.0	0.0														
72	0.0		Q72	B	0.0	0.0		Q90	B	0.0	0.0	60		0.0	0.0														
73	0.0	Q73		B	0.0	0.0	Q91		B	0.0	0.0		61	0.0	0.0														
74	0.0		Q74	B	0.0	0.0		Q92	B	0.0	0.0	62		0.0	0.0														
75	0.0	Q75		B	0.0	0.0	Q93		B	0.0	0.0		63	0.0	0.0														
76	0.0		Q76	B	0.0	0.0		Q94	B	0.0	0.0	64		0.0	0.0														
77	0.0	Q77		B	0.0	0.0	Q95		B	0.0	0.0		65	0.0	0.0														
78	0.0		Q78	B	0.0	0.0		Q96	B	0.0	0.0	66		0.0	0.0														
79	0.0	Q79		B	0.0	0.0	Q97		B	0.0	0.0		67	0.0	0.0														
80	0.0		Q80	B	0.0	0.0		Q98	B	0.0	0.0	68		0.0	0.0														
81	0.0	Q81		B	0.0	0.0	Q99		B	0.0	0.0		69	0.0	0.0														
82	0.0		Q82	B	0.0	0.0		Q100	B	0.0	0.0	70		0.0	0.0														
83	0.0	Q83		B	0.0	0.0	Q101		B	0.0	0.0		71	0.0	0.0														
84	0.0		Q84	B	0.0	0.0		Q102	B	0.0	0.0	72		0.0	0.0														
85	0.0	Q85		B	0.0	0.0	Q103		B	0.0	0.0		73	0.0	0.0														
86	0.0		Q86	B	0.0	0.0		Q104	B	0.0	0.0	74		0.0	0.0														
87	0.0	Q87		B	0.0	0.0	Q105		B	0.0	0.0		75	0.0	0.0														
88	0.0		Q88	B	0.0	0.0		Q106	B	0.0	0.0	76		0.0	0.0														
89	0.0	Q89		B	0.0	0.0	Q107		B	0.0	0.0		77	0.0	0.0														
90	0.0		Q90	B	0.0	0.0		Q108	B	0.0	0.0	78		0.0	0.0														
91	0.0	Q91		B	0.0	0.0	Q109		B	0.0	0.0		79	0.0	0.0														
92	0.0		Q92	B	0.0	0.0		Q110	B	0.0	0.0	80		0.0	0.0														
93	0.0	Q93		B	0.0	0.0	Q111		B	0.0	0.0		81	0.0	0.0														
94	0.0		Q94	B	0.0	0.0		Q112	B	0.0	0.0	82		0.0	0.0														
95	0.0	Q95		B	0.0	0.0	Q113		B	0.0	0.0		83	0.0	0.0														
96	0.0		Q96	B	0.0	0.0		Q114	B	0.0	0.0	84		0.0	0.0														
97	0.0	Q97		B	0.0	0.0	Q115		B	0.0	0.0		85	0.0	0.0														
98	0.0		Q98	B	0.0	0.0		Q116	B	0.0	0.0	86		0.0	0.0														
99	0.0	Q99		B	0.0	0.0	Q117		B	0.0	0.0		87	0.0	0.0														
100	0.0		Q100	B	0.0	0.0		Q118	B	0.0	0.0	88		0.0	0.0														
101	0.0	Q101		B	0.0	0.0	Q119		B	0.0	0.0		89	0.0	0.0														
102	0.0		Q102	B	0.0	0.0		Q120	B	0.0	0.0	90		0.0	0.0														
103	0.0	Q103		B	0.0	0.0	Q121		B	0.0	0.0		91	0.0	0.0														
104	0.0		Q104	B	0.0	0.0		Q122	B	0.0	0.0	92		0.0	0.0														
105	0.0	Q105		B	0.0	0.0	Q123		B	0.0	0.0		93	0.0	0.0														
106	0.0		Q106	B	0.0	0.0		Q124	B	0.0	0.0	94		0.0	0.0														
107	0.0	Q107		B	0.0	0.0	Q125		B	0.0	0.0		95	0.0	0.0														
108	0.0		Q108	B	0.0	0.0		Q126	B	0.0	0.0	96		0.0	0.0														
109	0.0	Q109		B	0.0	0.0	Q127		B	0.0	0.0		97	0.0	0.0														
110	0.0		Q110	B	0.0	0.0		Q128	B	0.0	0.0	98		0.0	0.0														
111	0.0	Q111		B	0.0	0.0	Q129		B	0.0	0.0		99	0.0	0.0														
112	0.0		Q112	B	0.0	0.0		Q130	B	0.0	0.0	100		0.0	0.0														
113	0.0	Q113		B	0.0	0.0	Q131		B	0																			

TP1	TP2	TP3	TP4	TP5	TP6
V-rate REC 0.22 Vp-p	V-rate PB 0.4 Vp-p	V-rate PB 0.3 Vp-p	H-rate REC 1.1 Vp-p	H-rate REC 1.1 Vp-p	H-rate REC 0.18 Vp-p

6

4.11 AUTO EQ SCHEMATIC DIAGRAM

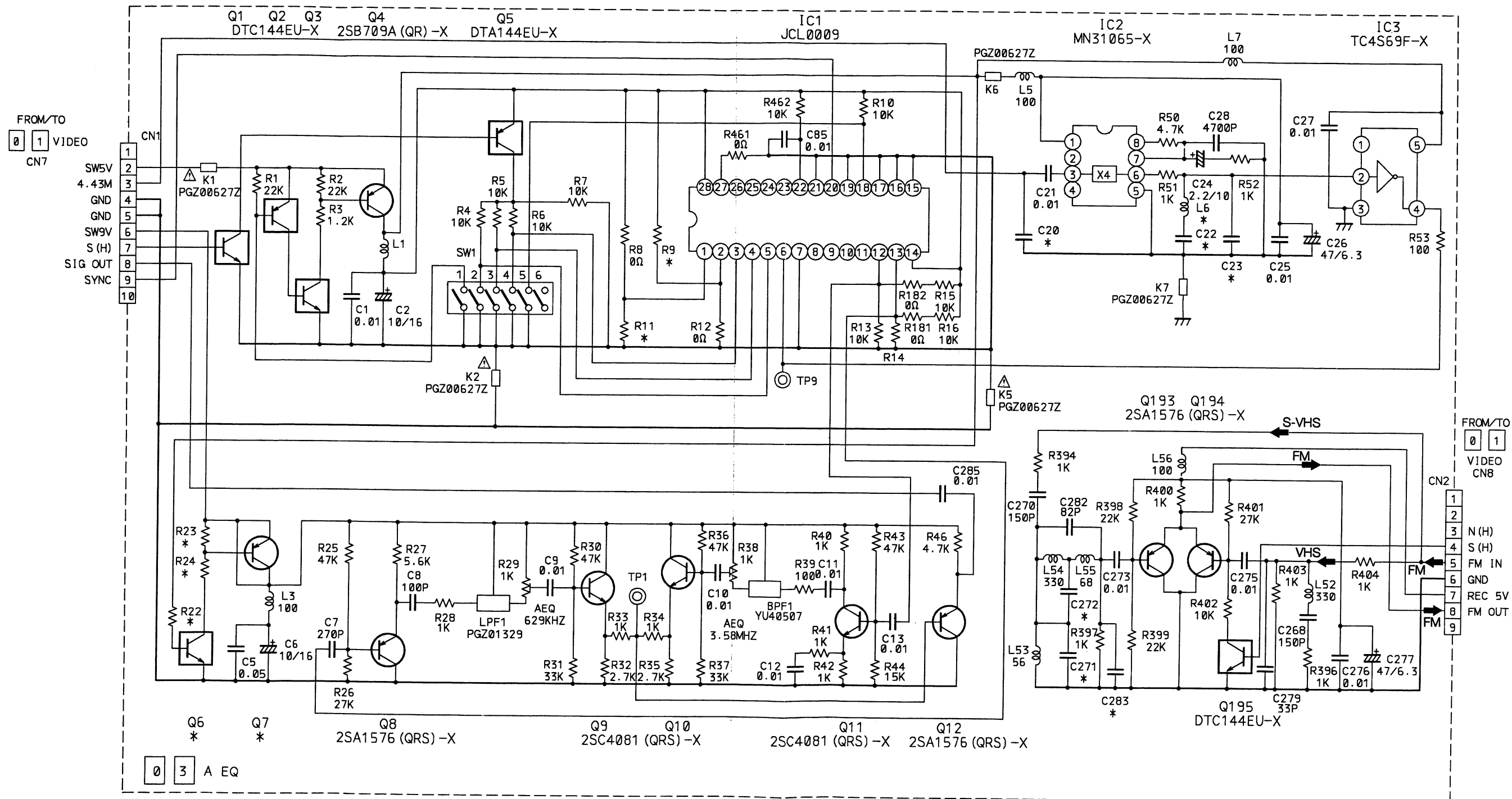
5

4

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2

1



A

B

C

4-18

4-18

E

F

G

H

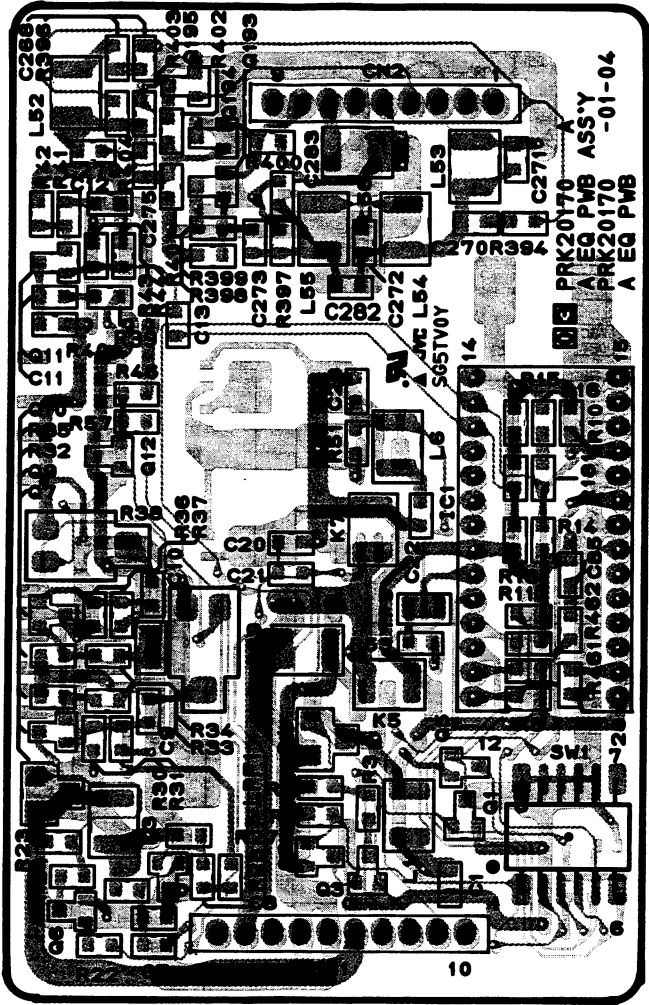
6
5
4
3
2
1

4.12 AUTO EQ CIRCUIT BOARD

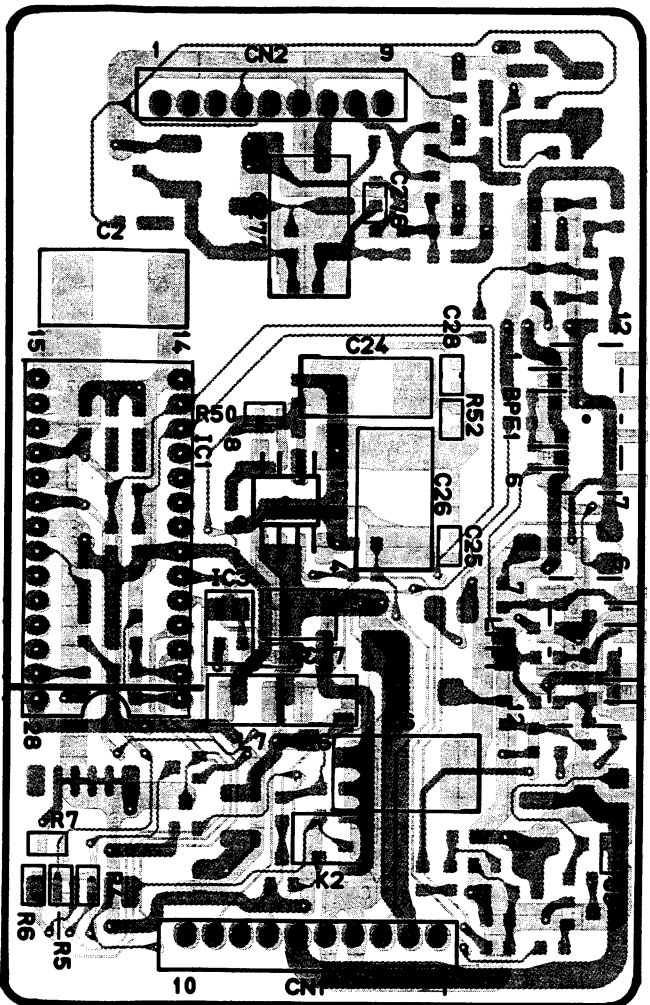
A EQ <03>

SYMBOL No.	REC	PB	SYMBOL No.	REC	PB
INTEGRATED CIRCUIT			Q5	B C E	0.0 4.9 5.0
IC1	1	5.0	Q8	B C E	3.3 0.0 3.9
	2	0.0	Q9	B C E	3.6 8.8 3.1
	3	4.4	Q10	B C E	3.6 3.8 3.1
	4	0.0	Q11	B C E	2.1 1.4 1.5
	5	0.0	Q12	B C E	3.0 3.6 3.7
	6	0.0	Q193	B C E	2.5 2.1 0.2
	7	0.0	Q194	B C E	1.5 0.0 0.1
	8	0.0	Q195	B C E	4.5 0.0 0.0
	9	0.0	CONNECTOR		
	10	0.0	CN1	1	NC
	11	0.0	CN2	2	NC
	12	0.0		3	NC
	13	0.0		4	NC
	14	0.0		5	NC
	15	0.0		6	NC
	16	0.0		7	NC
	17	0.0		8	NC
	18	0.0		9	NC
	19	0.0		10	NC
TRANSISTOR			CN2	1	NC
Q1	B C E	4.5 0.0 0.0		2	NC
Q2	B C E	0.0 5.2 5.2		3	NC
Q3	B C E	5.2 0.0 0.0		4	NC
Q4	B C E	4.3 5.1 5.2		5	NC

— SOLDER SIDE —



— PARTS SIDE —



A

B

C

4-19

4-19

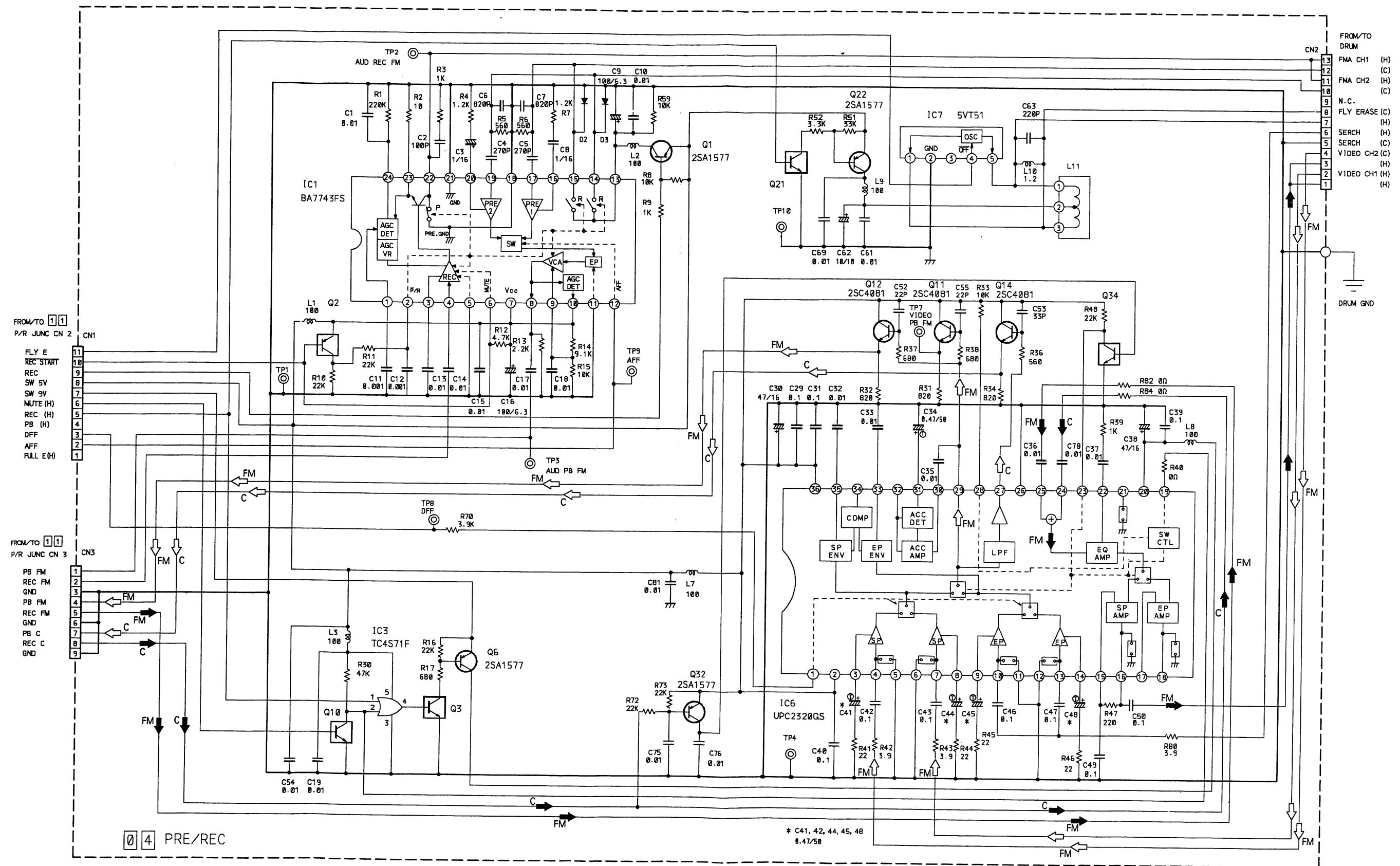
E

F

G

H

4.13 PRE/REC SCHEMATIC DIAGRAM



6

4.14 PRE/REC CIRCUIT BOARD

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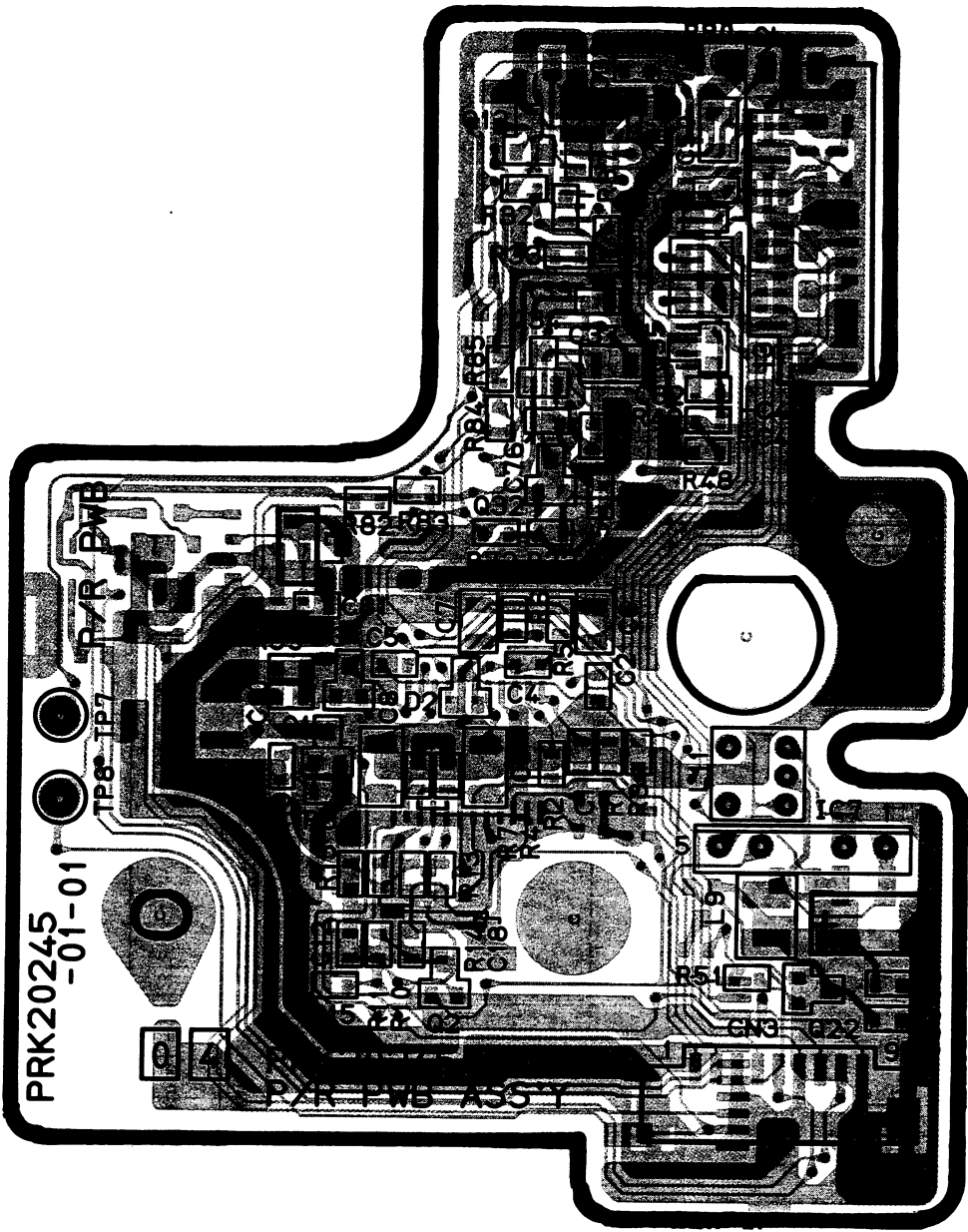
2

1

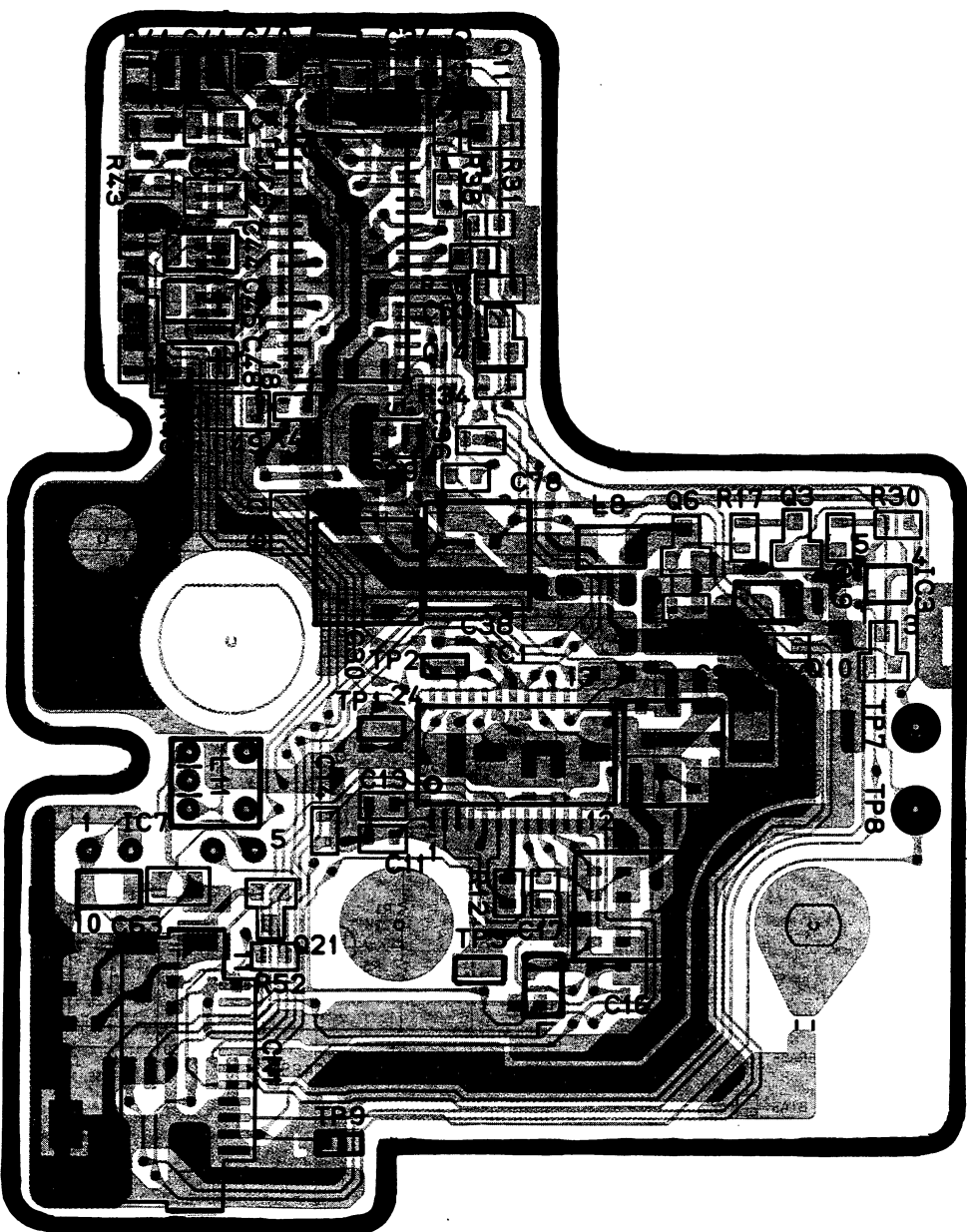
PRE/REC <04>

SYMBOL No.		REC	PB	SYMBOL No.	REC	PB	
INTEGRATED CIRCUIT				Q2	B C E	1.2 5.0 5.0	5.2 0.4 5.1
IC1	1	1.5	1.3	Q3	B C E	5.2 0.1 0.0	0.0 9.0 0.0
	2	1.2	0.8	Q6	B C E	8.2 8.9	9.0 0.0 9.0
	3	1.2	0.4	Q10	B C E	0.0 2.2 0.0	5.1 0.0 0.0
	4	1.1	0.1	Q11	B C E	3.9 3.1 3.3	2.4 5.0 0.0
	5	0.0	0.2	Q12	B C E	3.9 5.1 3.3	2.7 4.9 2.1
	6	0.0	0.5	Q14	B C E	4.0 5.1 3.3	2.4 5.0 1.8
	7	0.0	0.2	Q21	B C E	5.0 0.0 0.0	0.0 5.2 0.0
	8	0.0	0.0	Q22	B C E	4.5 5.2 5.2	5.2 5.2
	9	0.0	0.0	Q32	B C E	-0.1 0.0 5.1	4.9 0.0 4.9
	10	0.0	0.0	Q34	B C E	0.0 5.1 0.0	0.0 4.9 0.0
	11	0.0	0.0	CONNECTOR			
	12	0.0	0.0	CN1	1	5.2 0.0	0.0
	13	0.0	0.0		2	—	—
	14	0.0	0.0		3	—	—
	15	0.0	0.0		4	—	—
	16	0.0	0.0		5	0.0	0.0
	17	0.0	0.0		6	0.0	0.0
	18	0.0	0.0		7	0.0	0.0
	19	0.0	0.0		8	0.0	0.0
	20	0.0	0.0		9	0.0	0.0
	21	0.0	0.0		10	5.2	2.4
	22	0.0	0.0	11	1.1	2.0	
	23	0.0	0.0	12	0.0	0.0	
	24	0.0	0.0	CN2	1	Not measured	
25	0.0	0.0	2				
26	0.0	0.0	3				
27	0.0	0.0	4				
28	0.0	0.0	5				
29	0.0	0.0	6				
30	0.0	0.0	7				
31	0.0	0.0	8				
32	0.0	0.0	9				
33	0.0	0.0	10				
34	0.0	0.0	11				
35	0.0	0.0	12				
36	0.0	0.0	13				
IC3	1	5.0	0.0	CN3	1	0.0	0.0
	2	5.0	0.0		2	0.0	0.0
	3	5.0	0.0		3	0.0	0.0
	4	5.0	0.0		4	0.0	0.0
	5	5.2	5.2		5	0.0	0.0
IC6	1	2.8	-0.2	6	0.0	0.0	
	2	5.0	5.0	7	0.0	0.0	
	3	1.2	1.1	8	0.0	0.0	
	4	0.0	0.8	9	0.0	0.0	
	5	0.0	0.0	10	0.0	0.0	
IC7	6	0.0	0.0	Q1	B	0.0	5.3
	7	0.0	0.0		C	3.7	5.0
	8	0.0	0.0		E	0.0	5.2
	9	0.0	0.0		TRANSISTOR		
	10	0.0	0.0				
	11	0.0	0.0				
	12	0.0	0.0				
	13	0.0	0.0				
	14	0.0	0.0				
	15	0.0	0.0				
	16	0.0	0.0				
	17	0.0	0.0				
	18	0.0	0.0				
	19	0.0	0.0				
	20	0.0	0.0				
	21	0.0	0.0				
	22	0.0	0.0				
	23	0.0	0.0				
	24	0.0	0.0				
	25	0.0	0.0				
	26	0.0	0.0				
	27	0.0	0.0				
	28	0.0	0.0				
	29	0.0	0.0				
30	0.0	0.0					
31	0.0	0.0					
32	0.0	0.0					
33	0.0	0.0					
34	0.0	0.0					
35	0.0	0.0					
36	0.0	0.0					

— SOLDER SIDE —



— PARTS SIDE —



TP2	TP3	TP7	TP8	TP9
V-rate REC 3.6 Vp-p	V-rate PB 1.8 Vp-p	V-rate PB 0.2 Vp-p	REC/PB 5 Vp-p (25 Hz)	PB 5 Vp-p (25 Hz)

A

B

C

4-21

4-21

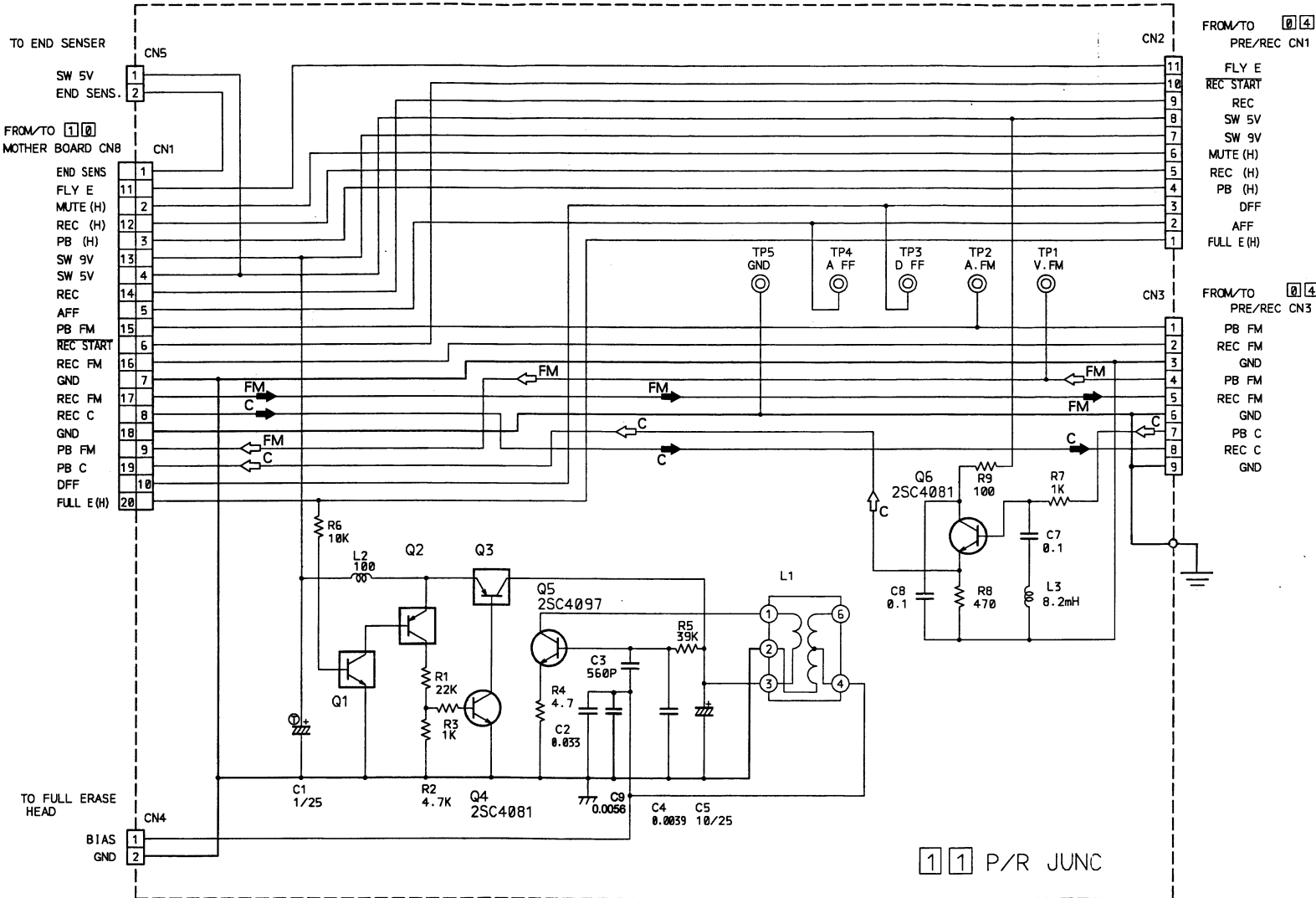
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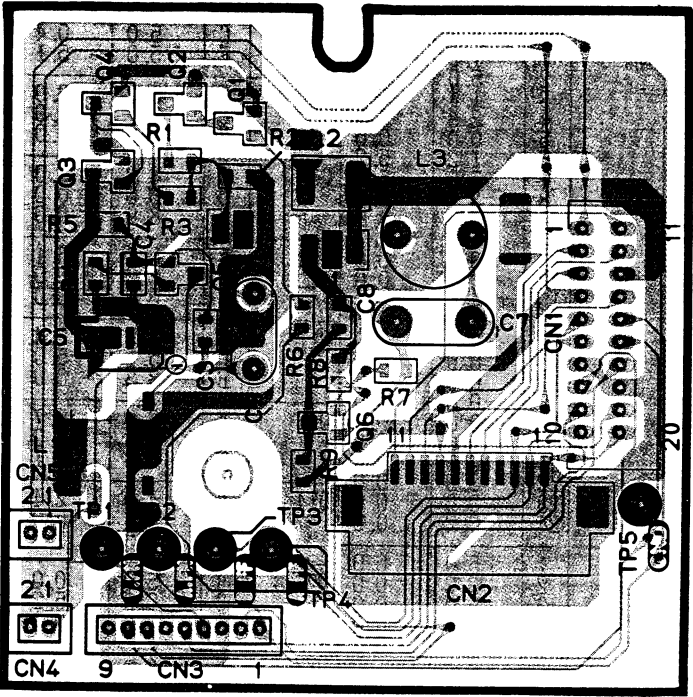
4.15 PRE/REC JUNC SCHEMATIC DIAGRAM AND CIRCUIT BOARD



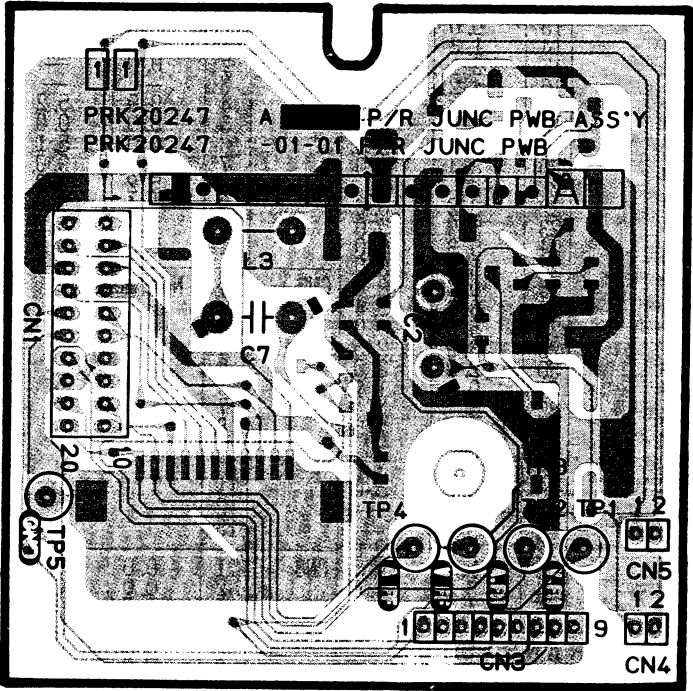
P/R JUNC <11>

SYMBOL No.	REC	PB
TRANSISTOR		
Q1	BCE 3.7 0.0 0.0	0.0 8.9 0.0
Q2	BCE 0.0 8.7 8.7	8.9 0.0 9.0
Q3	BCE 0.0 8.6 8.7	8.9 — 9.0
Q4	BCE 0.6 0.0 0.0	0.0 8.9 0.0
Q5	BCE -1.0 8.6 0.0	0.3 0.3 0.0
Q6	BCE	Not measured
CONNECTOR		
CN1	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
CN2	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
CN3	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
CN4	1 2	0.0 0.0
CN5	1 2	5.2 0.0

— PARTS SIDE —

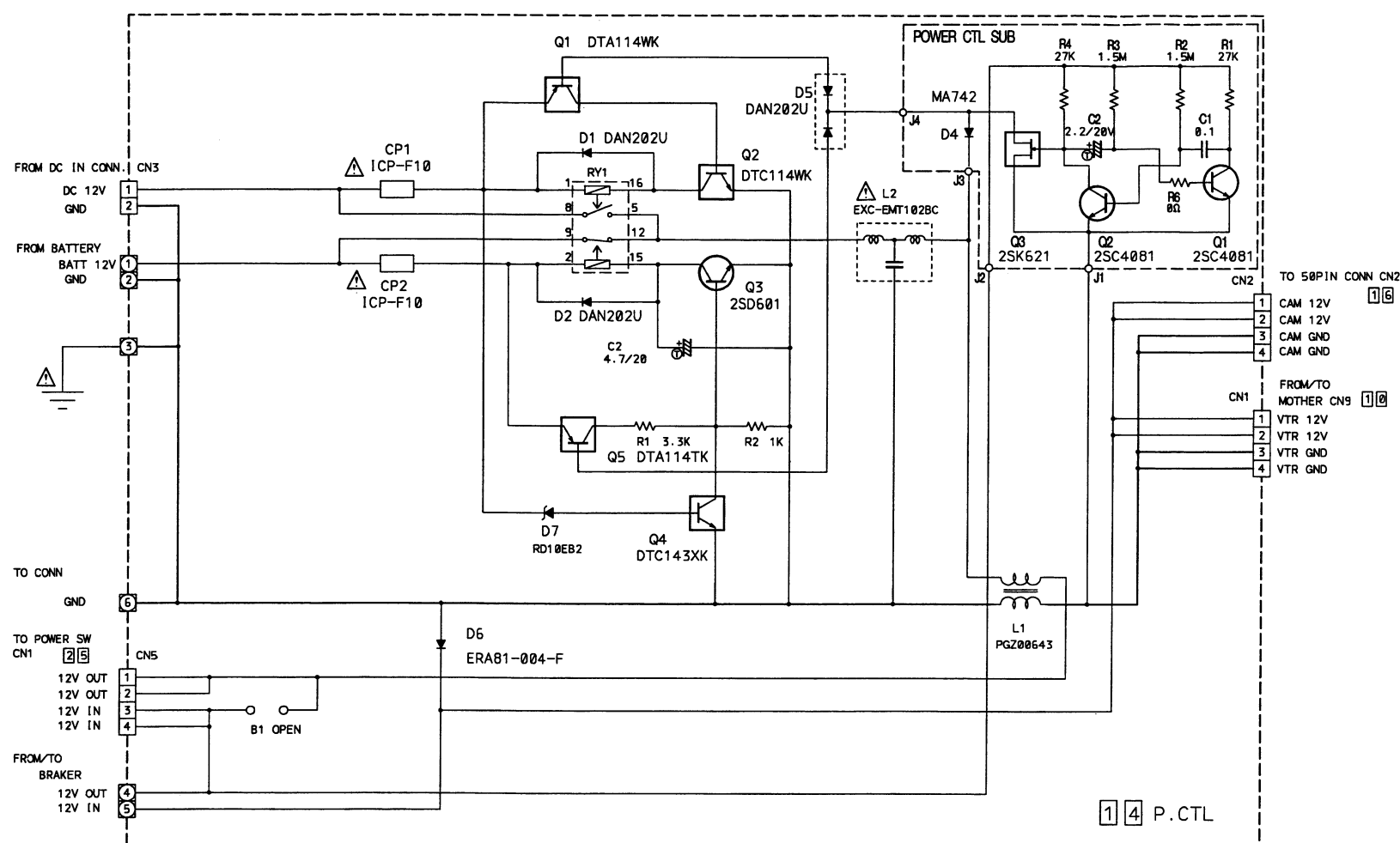


— SOLDER SIDE —

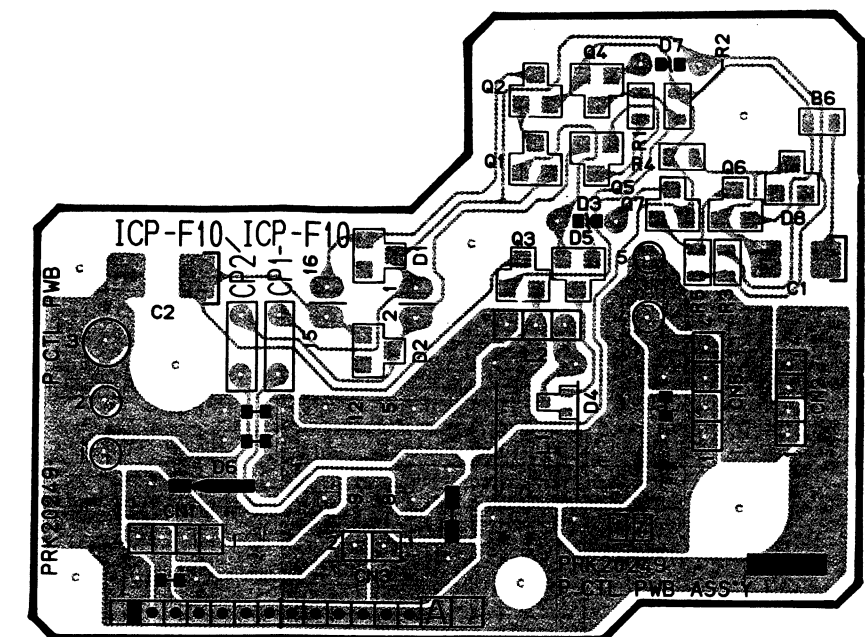


TP1	TP2	TP3	TP4
V-rate PB 0.2 Vp-p	V-rate PB 2 Vp-p	REC/PB 5 Vp-p (25 Hz)	PB 5 Vp-p (25 Hz)

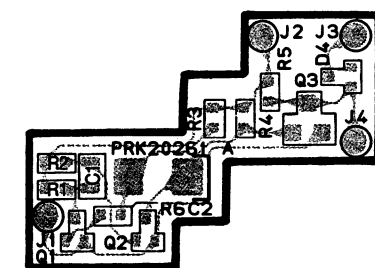
4.16 POWER CTL SCHEMATIC DIAGRAM AND CIRCUIT BOARD



— POWER CTL —



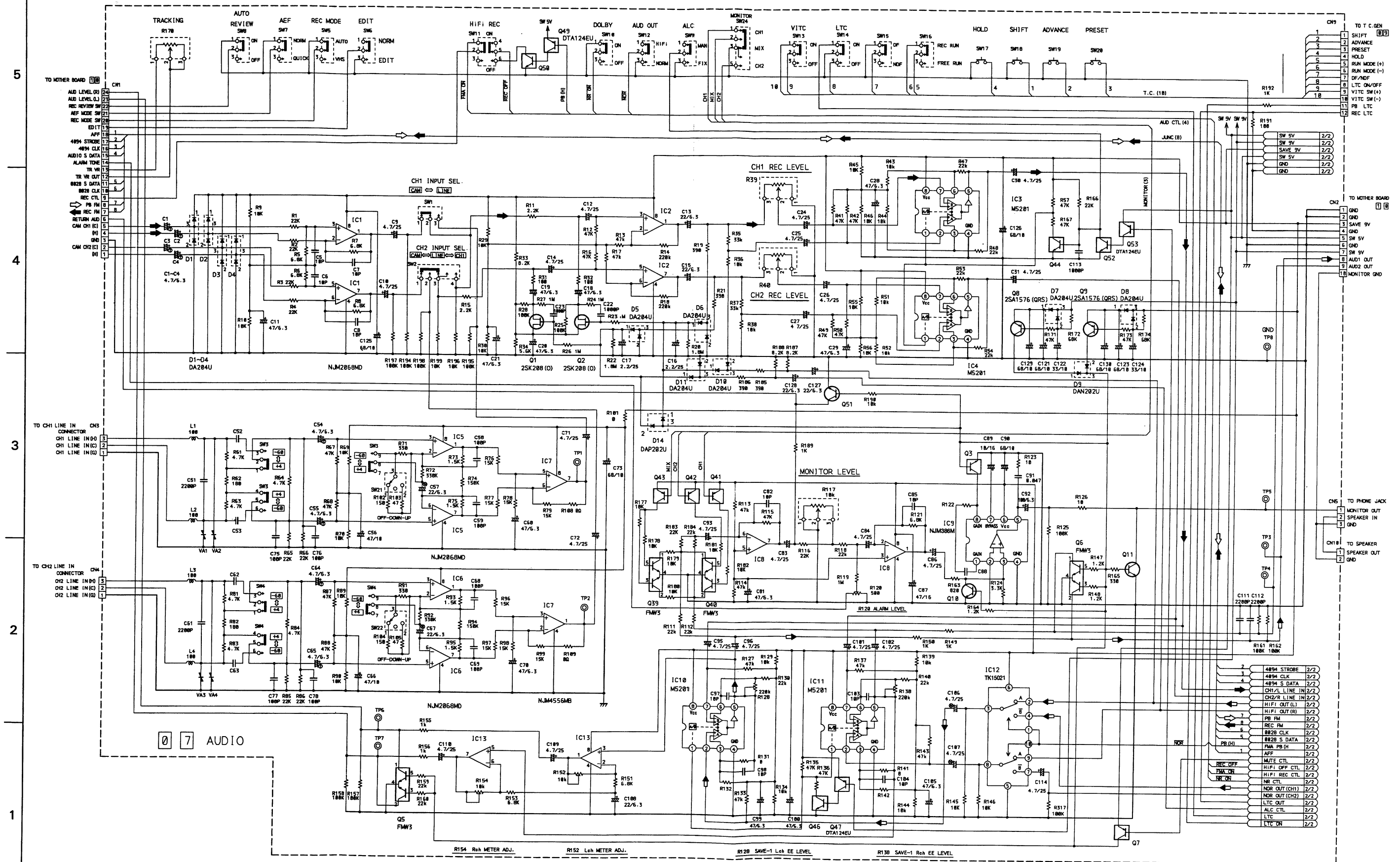
— POWER CTL SUB —



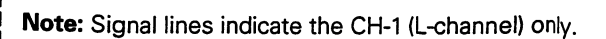
P. CTL <14> 1/1

SYMBOL No.		EE
TRANSISTOR		
Q1	B C E	13.1 0.0 13.1
Q2	B C E	0.0 13.1 0.0
Q3	B C E	0.0 0.5 0.0
Q4	B C E	3.5 0.0 0.0
Q5	B C E	0.4 0.0 0.1
Q6	B C E	0.6 0.0 0.0
Q7	B C E	0.0 3.7 0.0

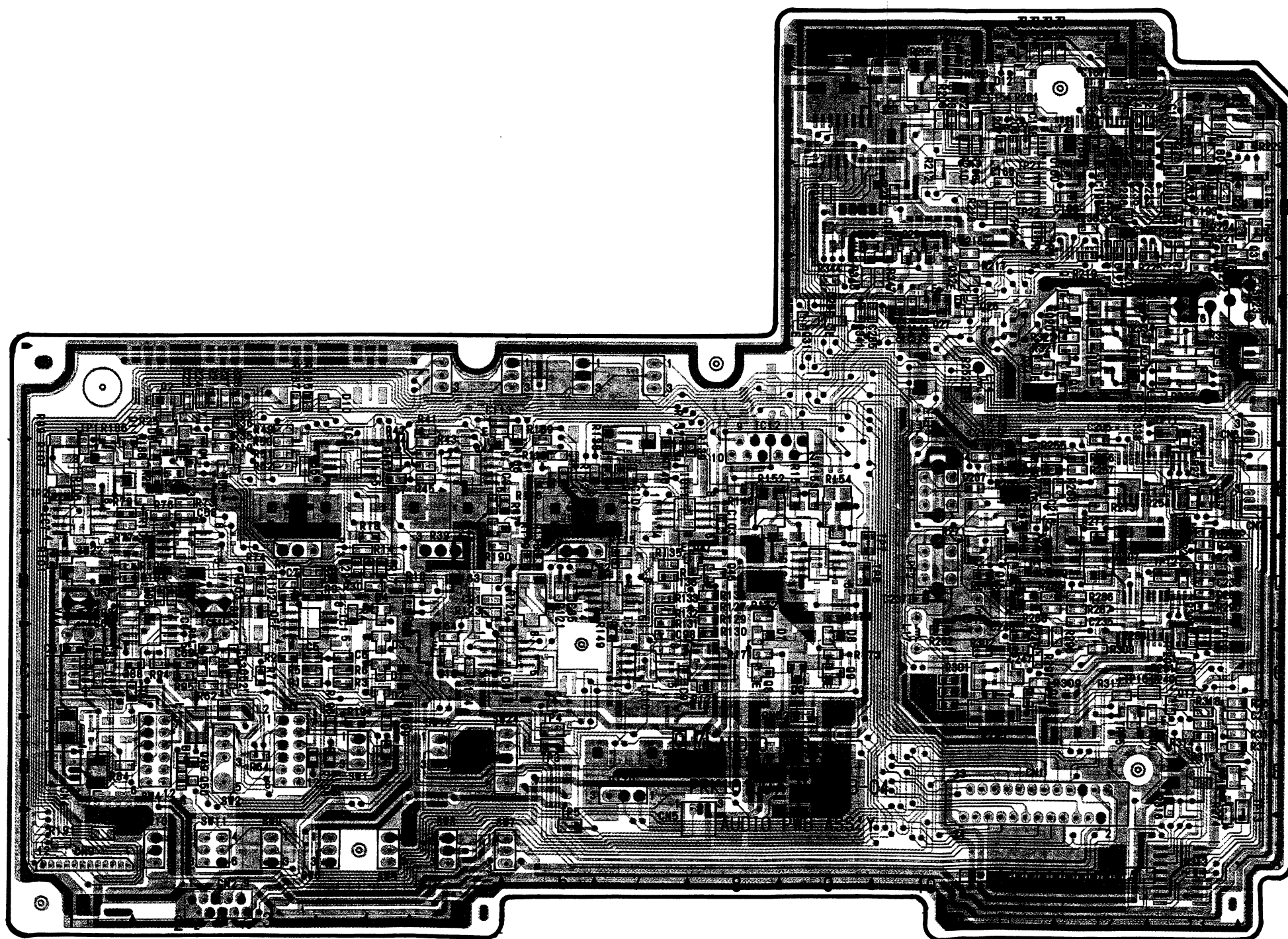
SYMBOL No.		EE	
CONNECTOR			
CN1	1		13.0
	2		13.0
	3		0.0
	4		0.0
	5		NC
	6		NC
CN2	1		13.0
	2		13.0
	3		0.0
	4		0.0
CN3	1		13.1
	2		0.0
CN5	1		13.0
	2		13.0
	3		13.0
	4		13.0



Note: Signal lines indicate the CH-1 (L-channel) only.



— SOLDER SIDE —

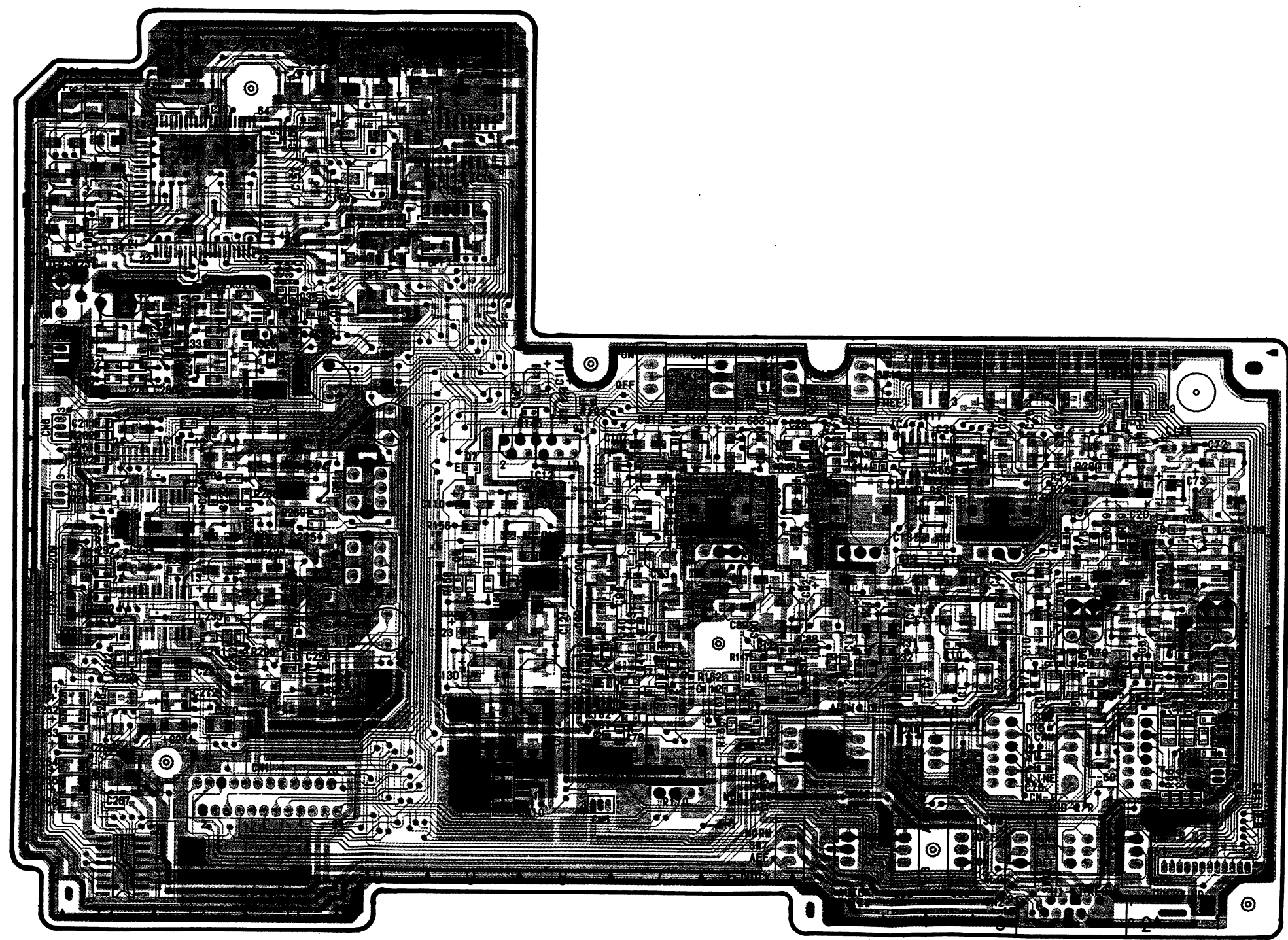


AUDIO BOARD

[illegible]

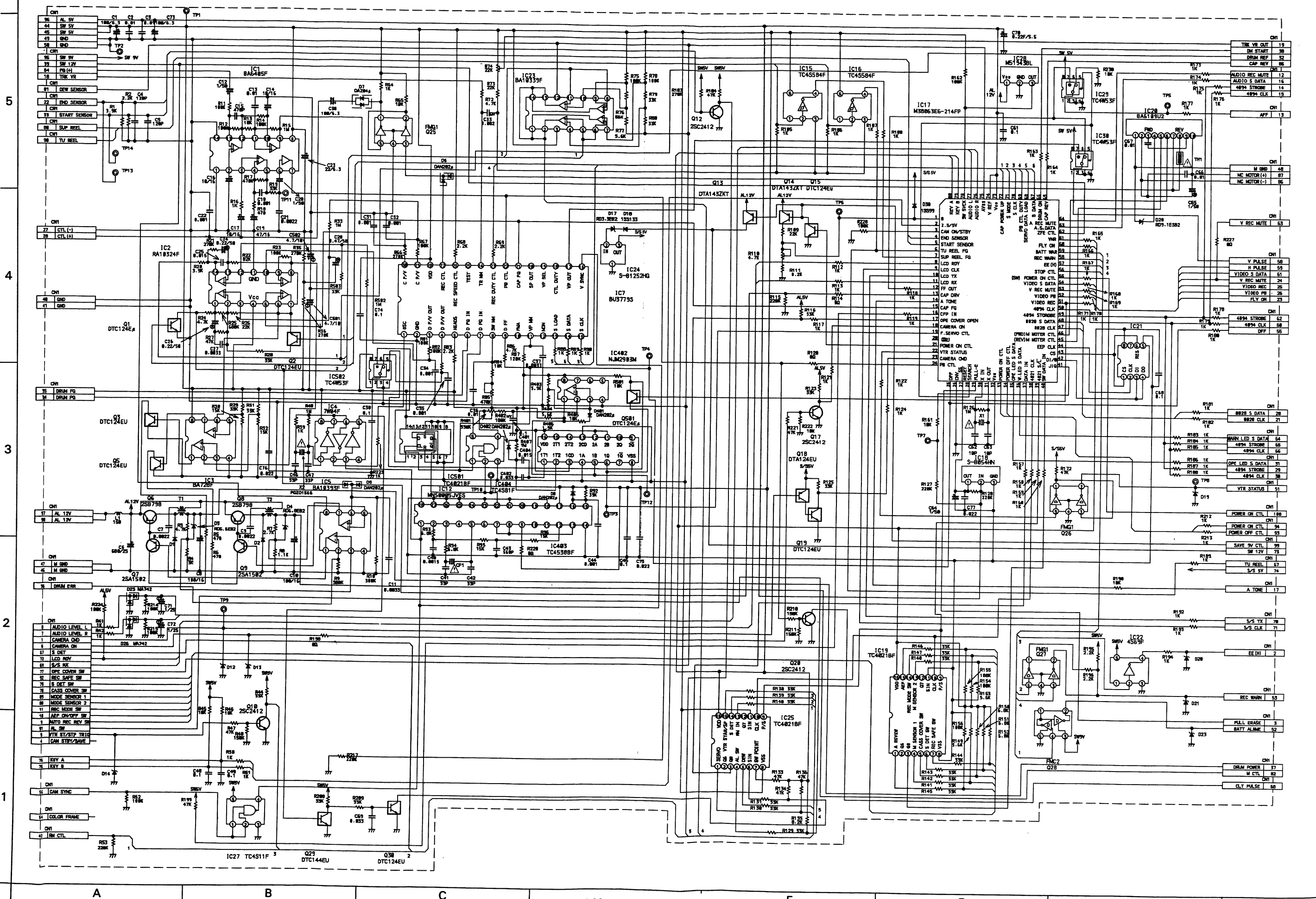
SYMBOL No.	REC	PB	SYMBOL No.	REC	PB
TRANSISTOR			Q47	8	9 1 0
Q19	8	9 1 0	Q49	8	9 1 0
Q20	8	9 1 0	Q50	8	9 1 0
Q21	8	9 1 0	Q51	8	9 1 0
Q22	8	9 1 0	CONNECTOR		
Q23	8	9 1 0	CN1	1	0 0 0
Q24	8	9 1 0	CN2	1	0 0 0
Q25	8	9 1 0	CN3	1	0 0 0
Q26	8	9 1 0	CN4	1	0 0 0
Q27	8	9 1 0	CN5	1	0 0 0
Q28	8	9 1 0	CN6	1	0 0 0
Q29	8	9 1 0	CN7	1	0 0 0
Q30	8	9 1 0	CN8	1	0 0 0
Q31	8	9 1 0	CN9	1	0 0 0
Q32	8	9 1 0	CN10	1	0 0 0
Q33	8	9 1 0			
Q34	8	9 1 0			
Q35	8	9 1 0			
Q36	8	9 1 0			
Q37	8	9 1 0			
Q38	8	9 1 0			
Q39	8	9 1 0			
Q40	8	9 1 0			
Q41	8	9 1 0			
Q42	8	9 1 0			
Q43	8	9 1 0			
Q44	8	9 1 0			
Q46	8	9 1 0			

— PARTS SIDE —

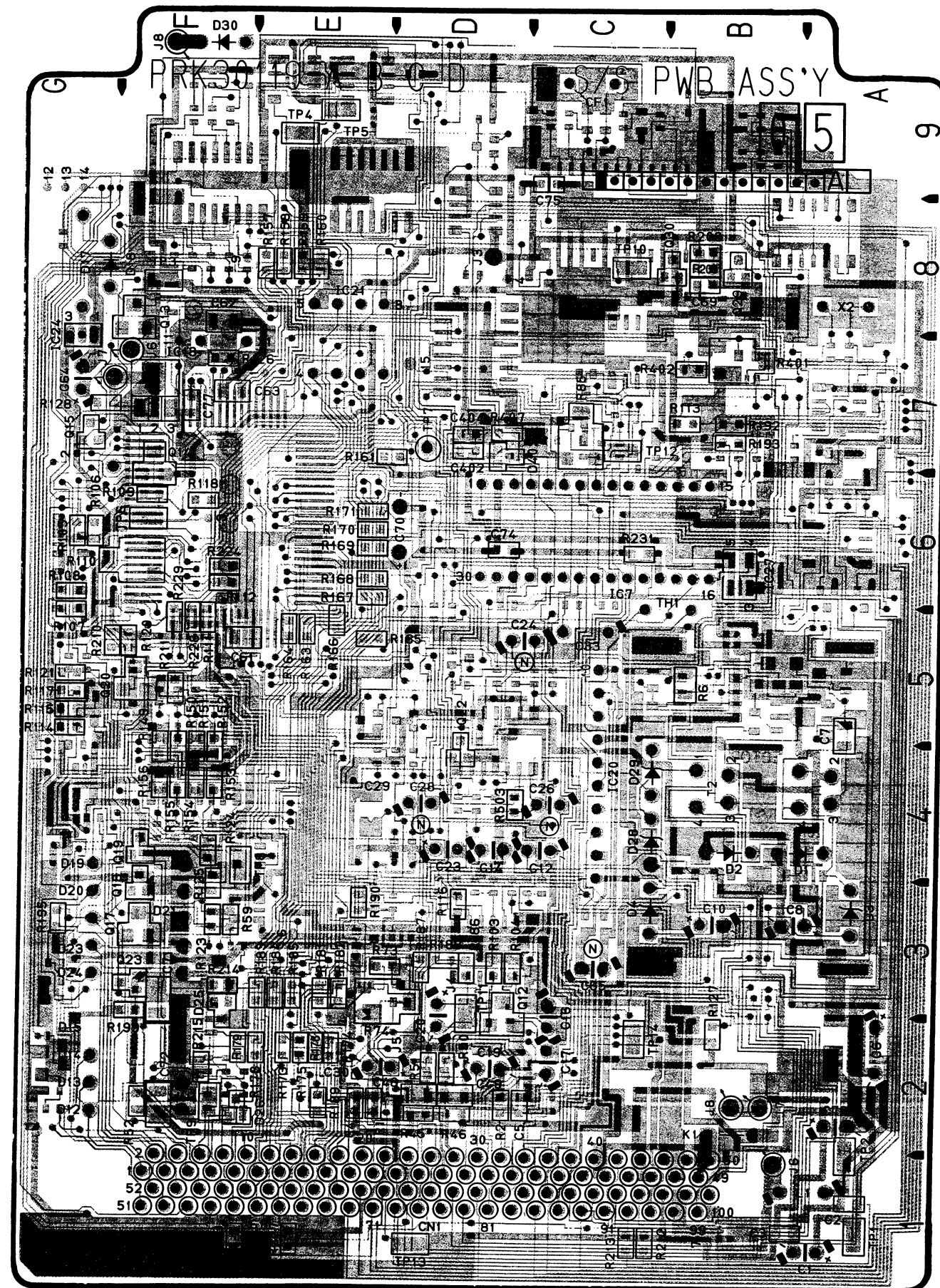


I J K L 4-27 4-27 M N O P

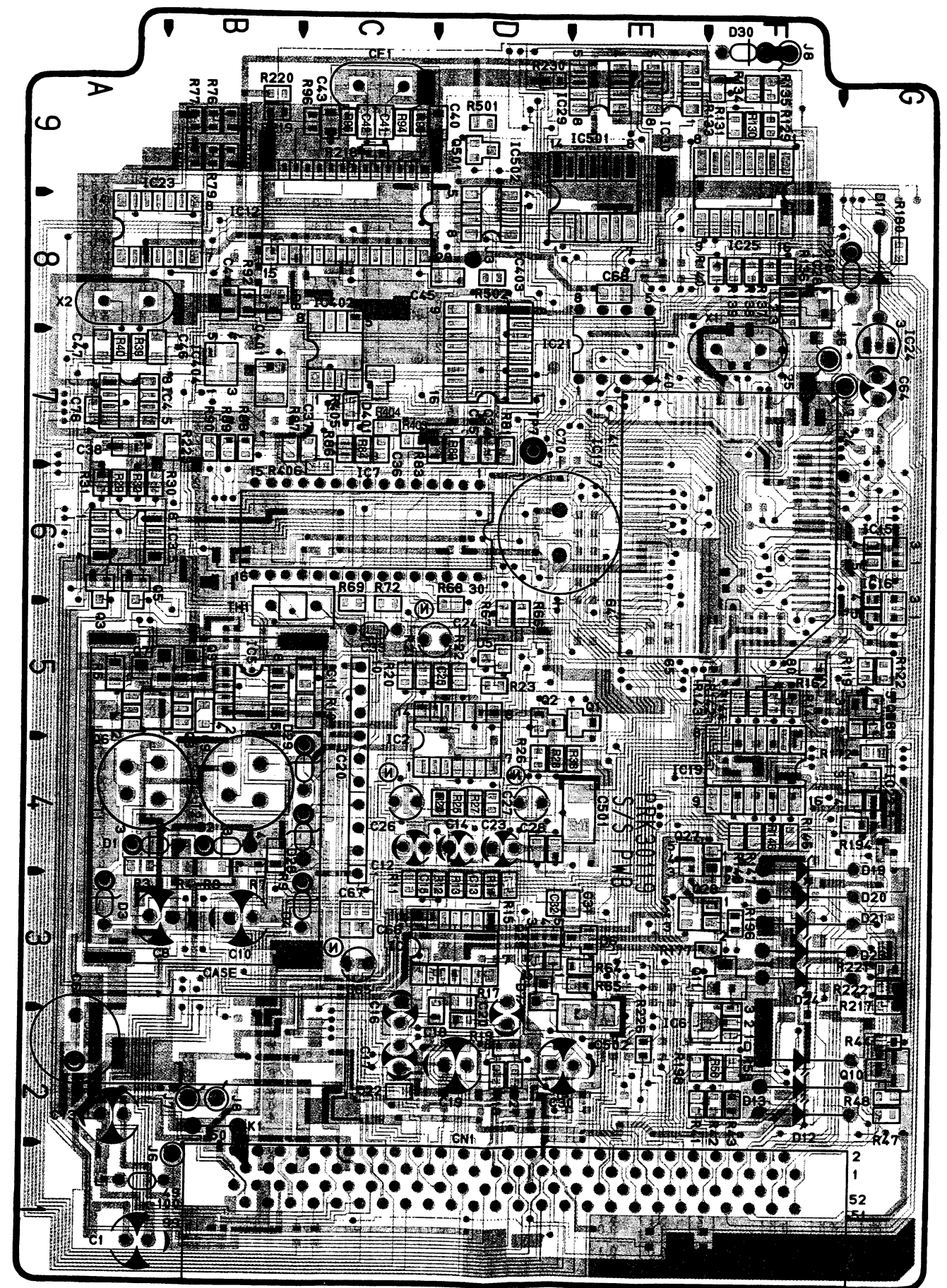
4.19 SYSCON/SERVO SCHEMATIC DIAGRAM



— SOLDER SIDE —



— PARTS SIDE —



[illegible]

4.21 50 PIN SCHEMATIC DIAGRAM AND CIRCUIT BOARD

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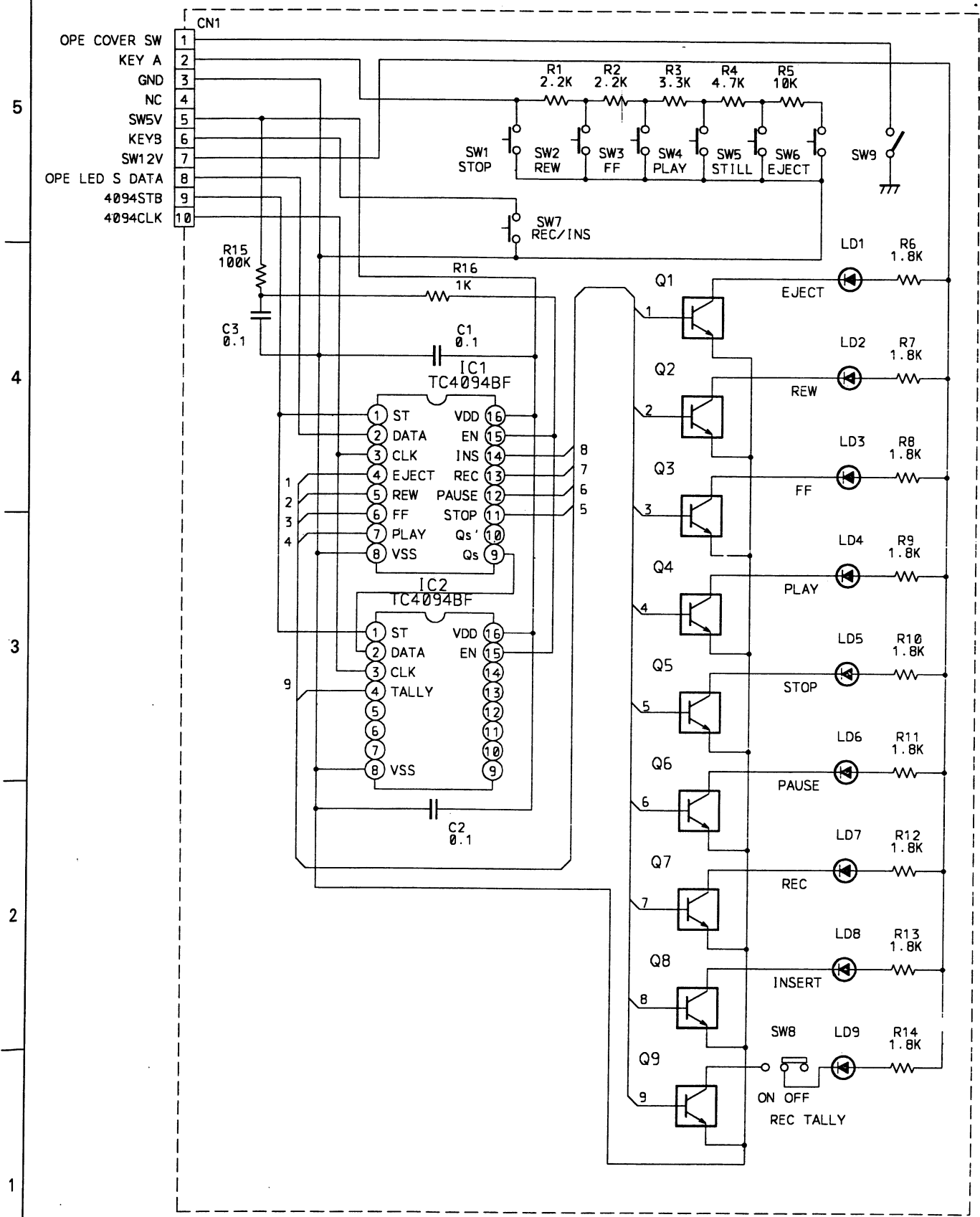
1

50PIN CONNECTOR

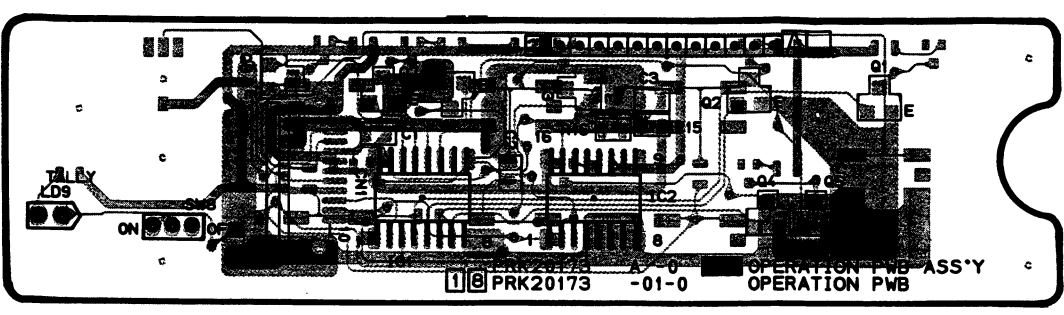
01	26
02	27 START/STOP
03	28
04	29
05 GND	30
06 GND	31 VTR SAVE
07	32 RETURN AUD
08	33 GND
09	34
10	35
11	36
12	37
13	38 EE
14 COLOR FLAME	39 12 V
15 AUD CH1 GND	40 12 V
16 (C)	41 Y IN
17 (H)	42 GND
18 RETURN Y	43
19	44
20 C IN	45 COMP.VIDEO
21 GND	46 GND
22	47
23 AUD CH2 (C)	48 VTR STATUS
24 (H)	49 REC WARN
25 CAM P ON	50 BATT ALARM

1 6 50PIN CONN.

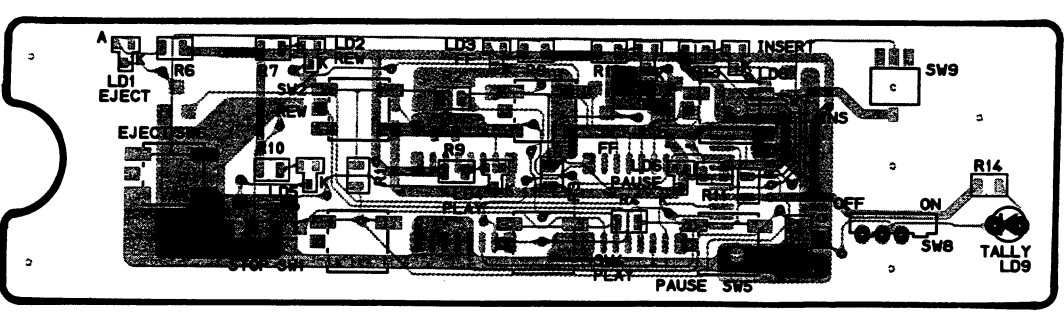
4.22 OPERATION SCHEMATIC DIAGRAM AND CIRCUIT BOARD



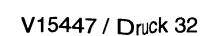
— SOLDER SIDE —



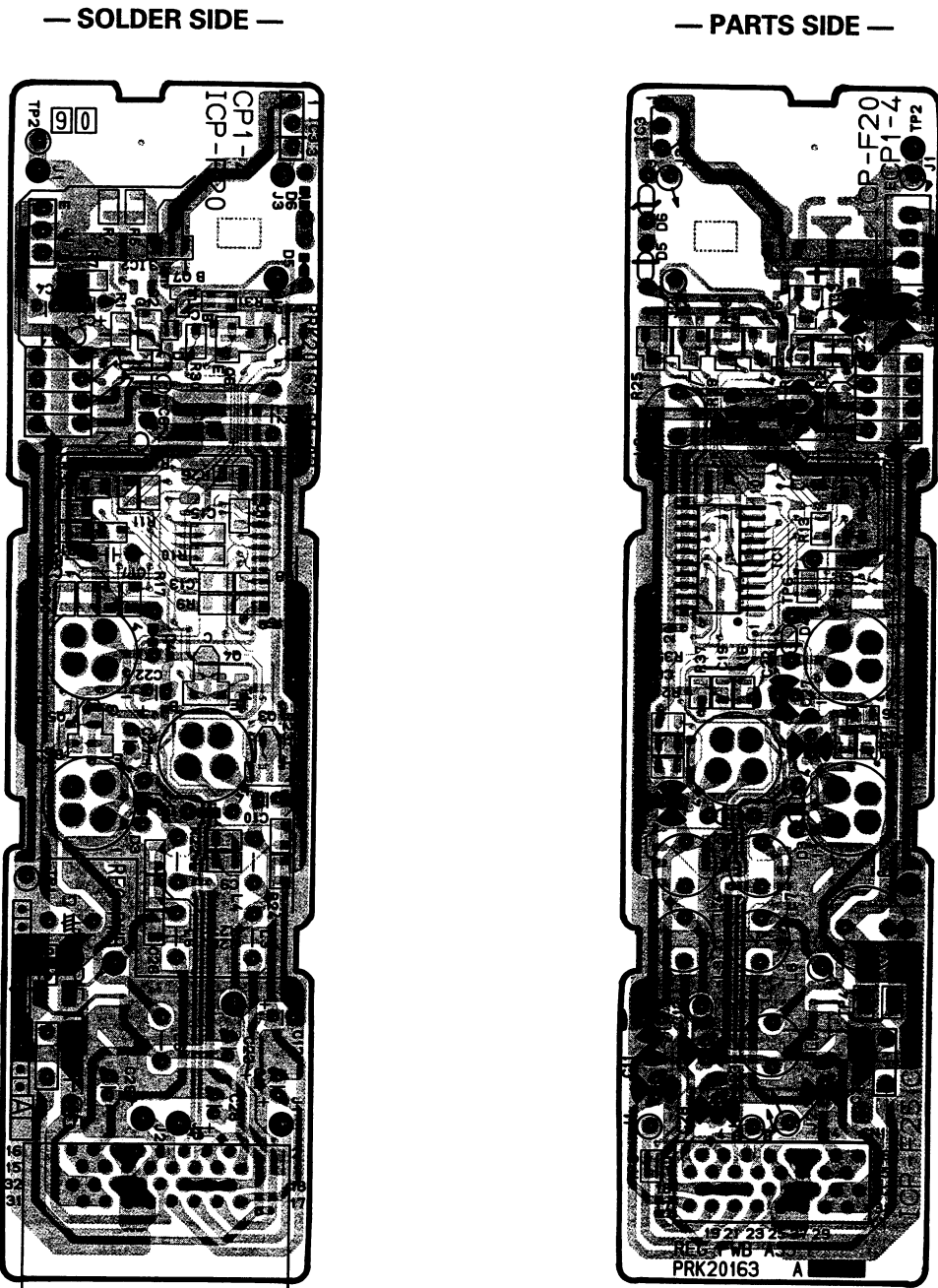
— PARTS SIDE —



OPERATION BOARD			
SYMBOL No.	REC	PB	
INTEGRATED CIRCUIT			
IC1	1	0.0	0.1
	2	0.1	0.1
	3	0.1	0.1
	4	0.0	0.0
	5	0.0	0.0
	6	0.0	0.0
	7	5.2	5.2
	8	0.0	0.0
	9	0.1	0.1
	10	0.0	0.1
	11	0.0	0.0
	12	0.0	0.0
	13	5.2	0.0
	14	0.0	0.0
	15	5.2	5.2
	16	5.2	5.2
IC2	1	0.0	0.0
	2	0.1	0.1
	3	0.1	0.0
	4	5.2	0.0
	5	0.0	0.0
	6	0.0	0.0
	7	0.0	0.0
	8	0.1	0.1
	9	0.0	0.0
	10	0.1	0.0
	11	5.2	0.0
	12	5.2	0.0
	13	5.2	5.2
	14	5.2	5.2
	15	5.2	5.2
	16	5.2	5.2
TRANSISTOR			
Q1	BCE	0.0	0.0
		11.0	0.0
Q2	BCE	0.0	0.0
		11.0	0.0
Q3	BCE	0.0	0.0
		11.0	0.0
Q4	BCE	5.2	5.2
		0.1	0.0
Q5	BCE	0.0	0.0
		11.0	0.0
Q6	BCE	0.0	0.0
		11.0	0.0
Q7	BCE	5.2	0.0
		0.1	11.0
Q8	BCE	0.0	0.0
		11.0	0.0
Q9	BCE	5.2	0.0
		0.1	11.0
CONNECTOR			
CN1	1	5.1	5.1
	2	5.2	5.2
	3	0.0	0.0
	4	0.1	0.1
	5	5.2	5.2
	6	5.2	5.2
	7	12.3	12.3
	8	0.1	0.1
	9	0.0	0.0
	10	0.1	0.1



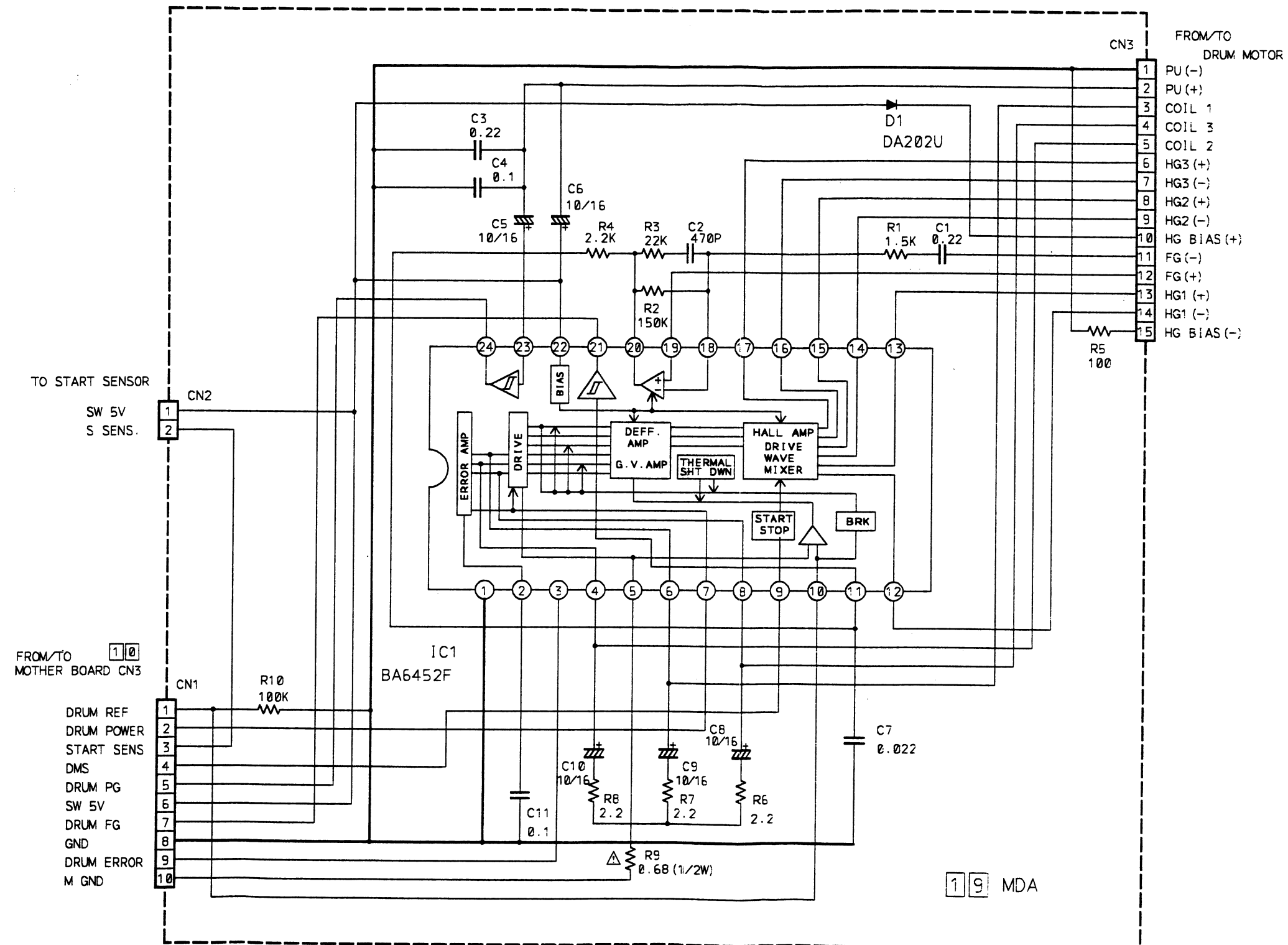
4.24 REGULATOR CIRCUIT BOARD



REGULATOR BOARD

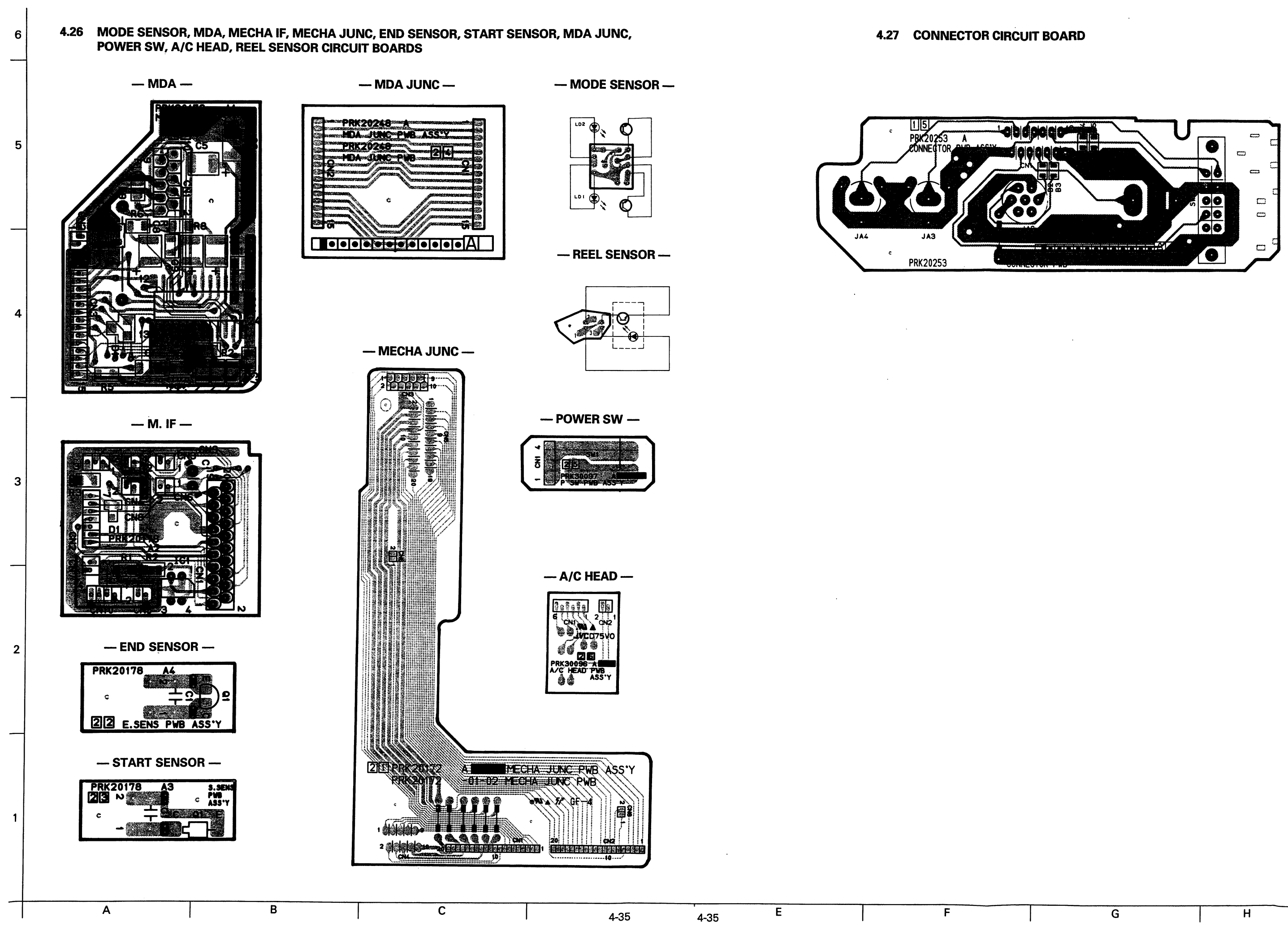
SYMBOL No.		REC	PB	SYMBOL No.		REC	PB
INTEGRATED CIRCUIT				CONNECTOR			
IC1	1	2.5	2.5	CN1	1	9.0	9.0
	2	1.6	1.6		2	5.1	5.1
	3	1.3	1.3		3	12.3	12.4
	4	1.3	1.3		4	12.3	12.4
	5	1.3	1.3		5	0.1	0.1
	6	1.9	1.9		6	4.8	4.8
	7	1.9	1.9		7	12.3	12.3
	8	6.0	6.0		8	0.0	0.0
	9	0.0	0.0		9	0.0	0.0
	10	7.5	7.5		10	0.0	0.0
	11	1.9	1.9		11	0.0	0.0
	12	1.4	1.4		12	0.0	0.0
	13	1.3	1.3		13	5.5	5.5
	14	0.0	0.0		14	5.2	5.2
	15	4.1	4.1		15	5.2	5.3
	16	1.9	1.9		16	5.2	5.3
	17	1.6	1.6		17	9.1	9.1
	18	1.3	1.3		18	0.0	0.0
	19	4.8	4.8		19	5.3	5.3
	20	11.7	11.7		20	0.0	0.0
IC2	1	11.4	11.4	21	9.1	9.1	
	2	0.0	0.0	22	0.0	0.0	
	3	1.3	1.3	23	9.0	9.0	
IC3	1	0.0	0.0	24	5.2	5.2	
	2	9.8	9.8	25	0.0	0.0	
	3	5.1	5.1	26	0.0	0.0	
TRANSISTOR				27	0.0	0.0	
Q1	B	11.7	11.7	28	0.0	0.0	
	C	9.1	9.1	29	12.4	12.4	
	E	12.3	12.3	30	12.4	12.4	
Q2	G	5.3	5.3	31	12.4	12.4	
	D	11.4	11.4	32	12.4	12.4	
	S	11.7	11.7				
Q3	B	11.6	11.6				
	C	9.2	9.2				
	E	12.2	12.2				
Q4	B	11.8	11.8				
	C	5.4	5.4				
	E	12.2	12.2				
Q5	B	11.8	11.8				
	C	5.3	5.3				
	E	12.2	12.2				
Q6	B	11.6	11.6				
	C	12.3	12.3				
	E	0.3	0.3				
Q7	B	4.8	4.8				
	C	0.1	0.1				
	E	0.0	0.0				

4.25 MDA SCHEMATIC DIAGRAM



4.26 MODE SENSOR, MDA, MECHA IF, MECHA JUNC, END SENSOR, START SENSOR, MDA JUNC, POWER SW, A/C HEAD, REEL SENSOR CIRCUIT BOARDS

4.27 CONNECTOR CIRCUIT BOARD



6

4.28 MECHA IF, MECHA JUNC SCHEMATIC DIAGRAM

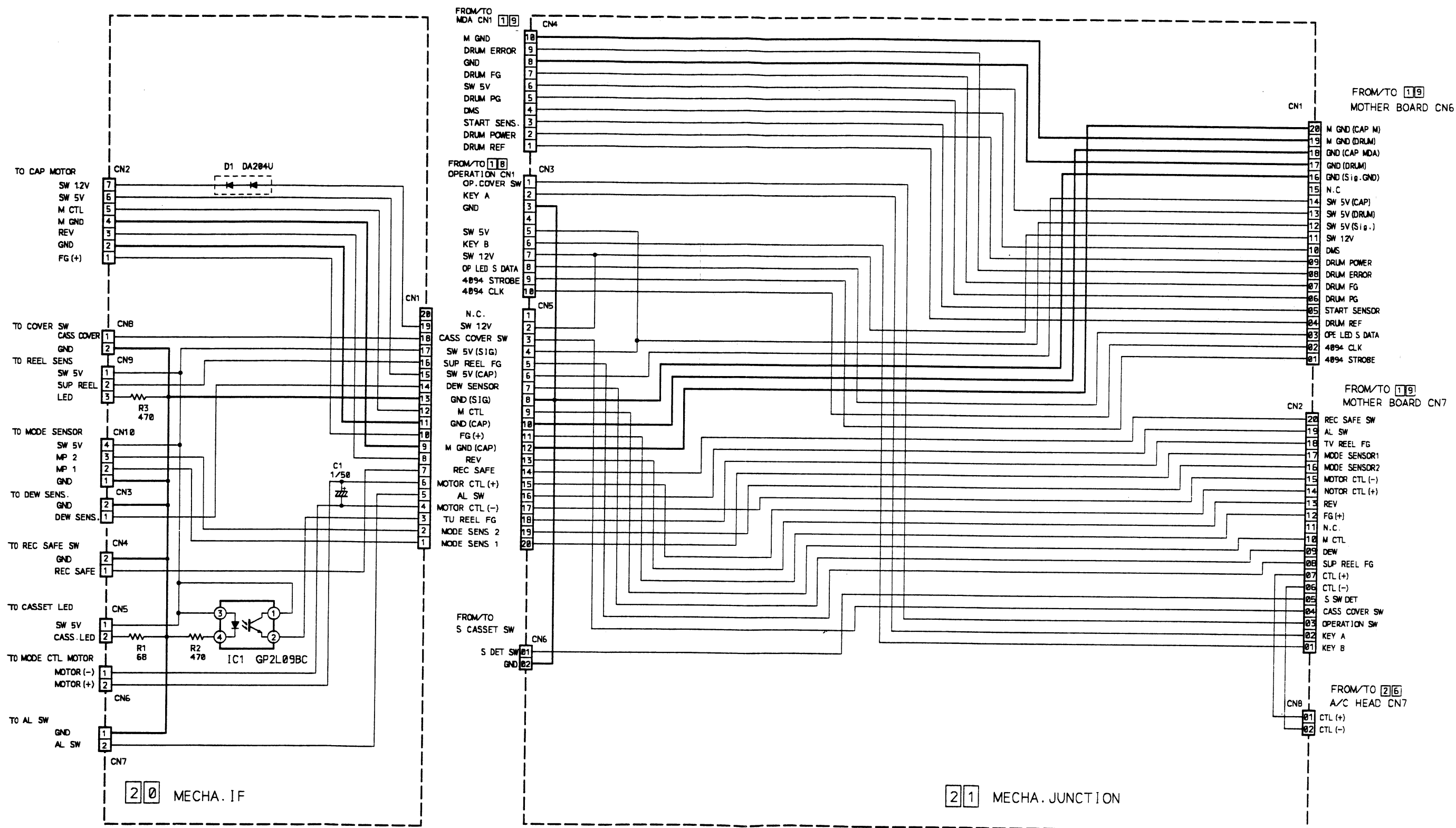
5

4

3

2

1



4-36

4-36

E

F

G

H

6

5

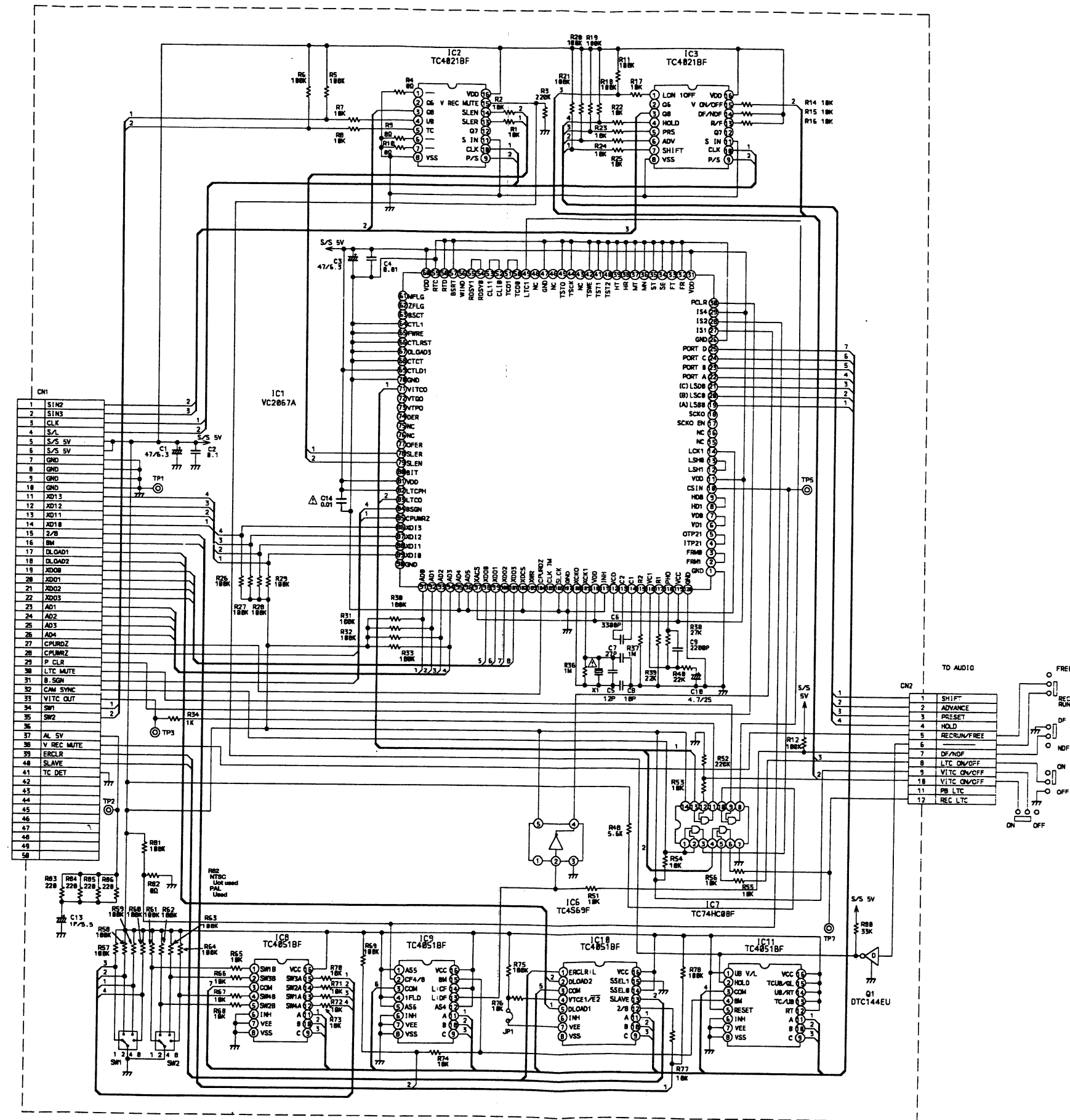


3

2

1

4.30 TIME CODE SCHEMATIC DIAGRAM (SA-R200E OPTION)



6

5



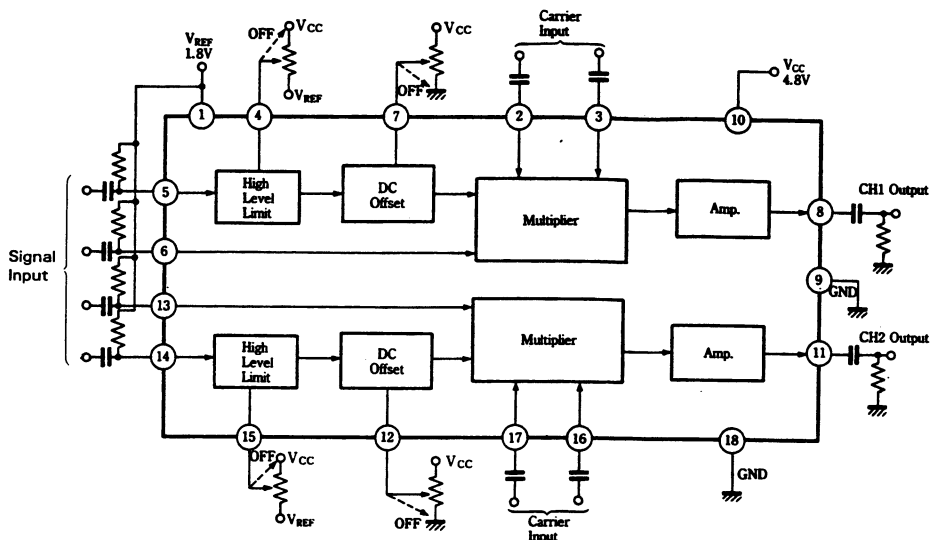
3



H

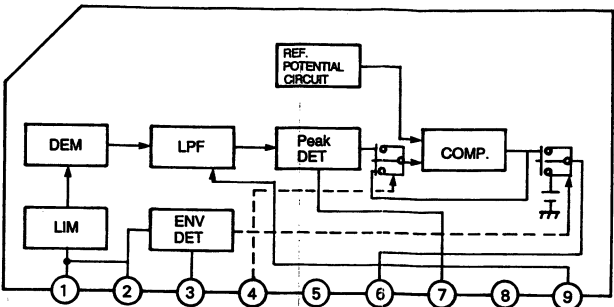
4.32 IC BLOCK DIAGRAM

■ AN2020S [MATSUSHITA]
(Dual Balanced Modulator)

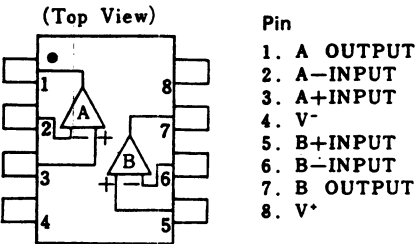


Pin function			
Pin No.	Pin Name	Pin No.	Pin Name
1	V _{REF} (1.8V)	10	V _{CC} (4.8V)
2	CH1 Carrier Input 1	11	CH2 Output
3	CH1 Carrier Input 2	12	CH2 DC Offset
4	CH1 High Level Limit	13	CH2 Signal Input 2
5	CH1 Signal Input 1	14	CH2 Signal Input 1
6	CH1 Signal Input 2	15	CH2 High Level Limit
7	CH1 DC Offset	16	CH2 Carrier Input 2
8	CH1 Output	17	CH2 Carrier Input 1
9	GND	18	GND

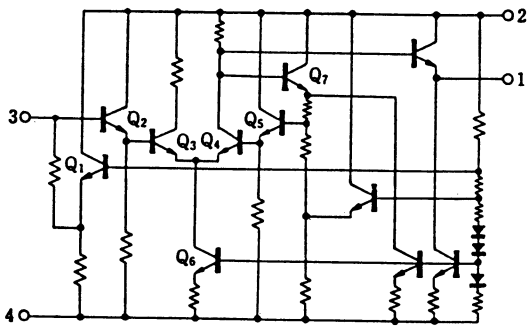
■ AN3398 [MATSUSHITA]
(VTR S-VHS Detector)



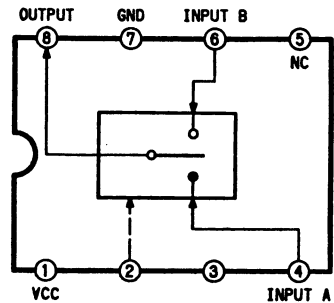
■ BA10393F [ROHM]
(Dual Comparator)



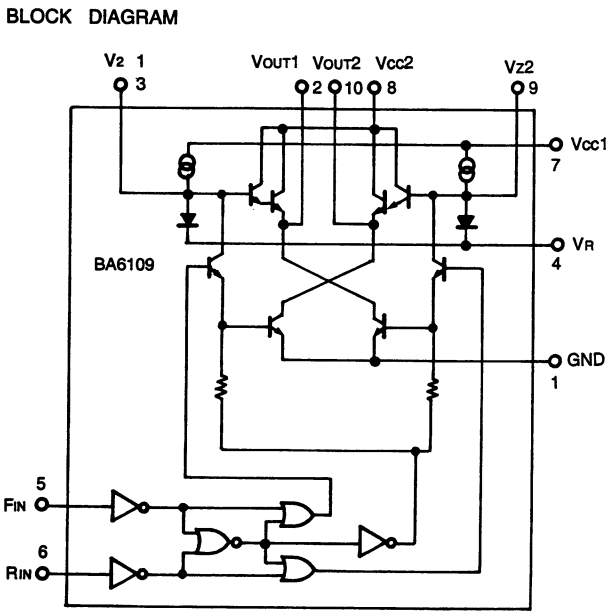
■ AN608P [MATSUSHITA]
(Amp.)



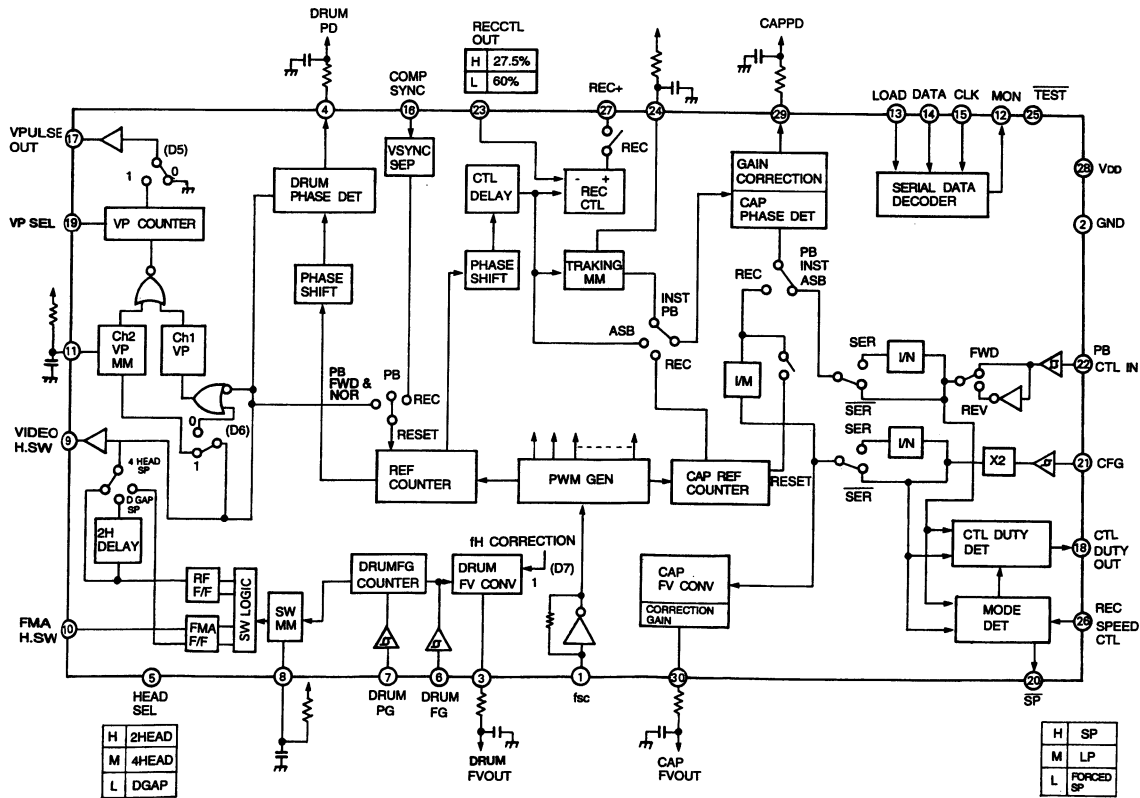
■ AN6308S [MATSUSHITA]
(VTR Analog Switch)



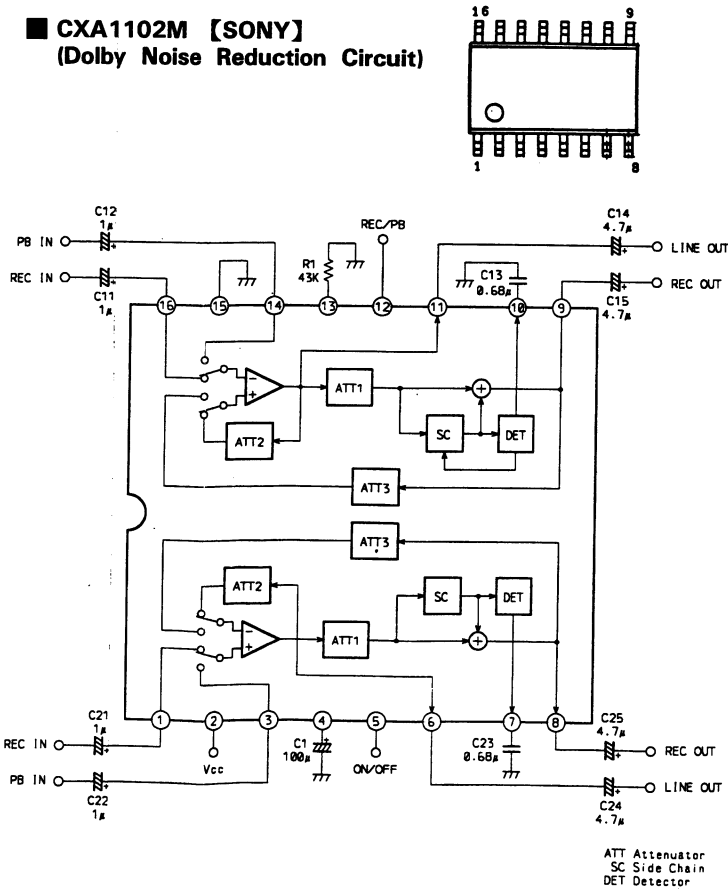
■ BA6109U2 [ROHM]
(Reversible Motor Driver)



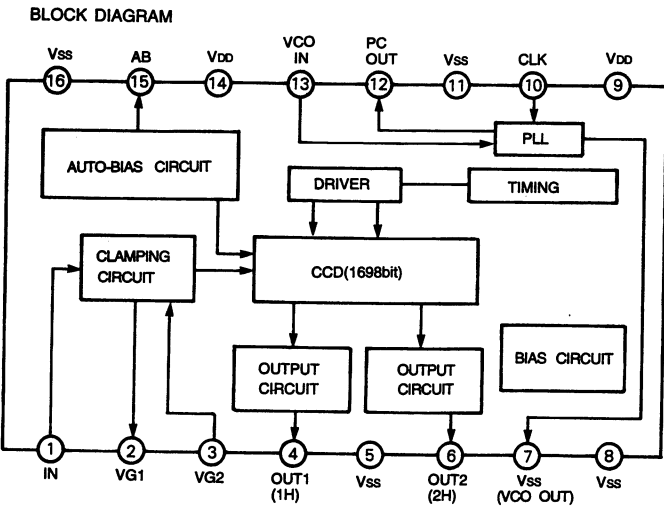
■ BU3779S [ROHM]
(VTR Digital Servo Circuit)



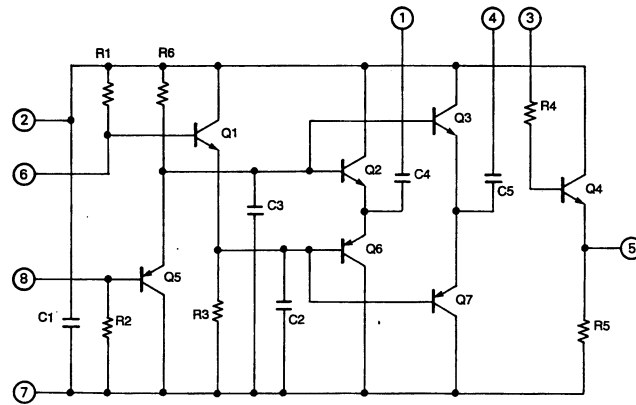
■ CXA1102M [SONY]
(Dolby Noise Reduction Circuit)



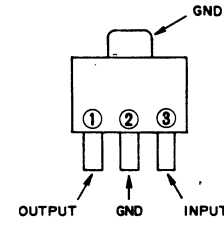
■ CXL1506M [SONY]
(CMOS CCD 1H/2H Delay Line)



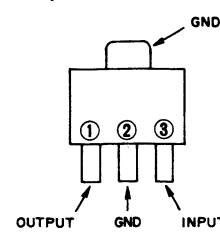
■ JCL0007 [JVC]
(Limiter circuit)



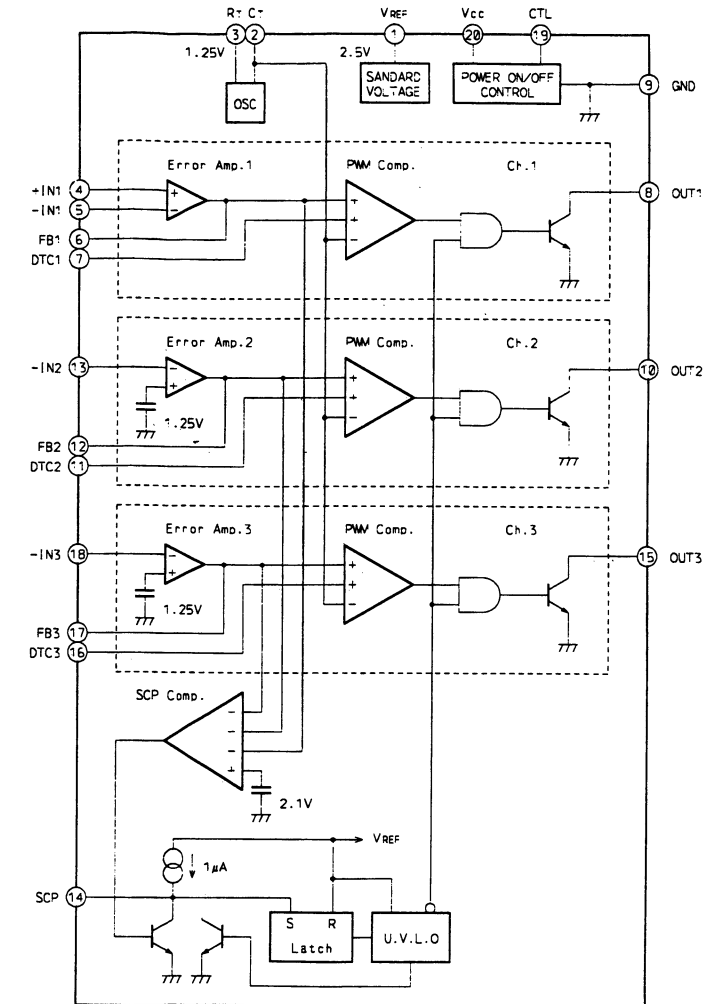
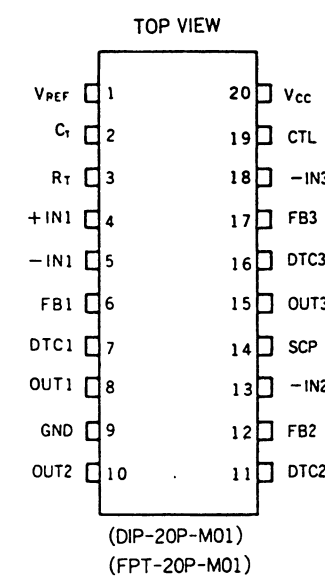
■ M5237ML [MITSUBISHI]
(Voltage Regulator)



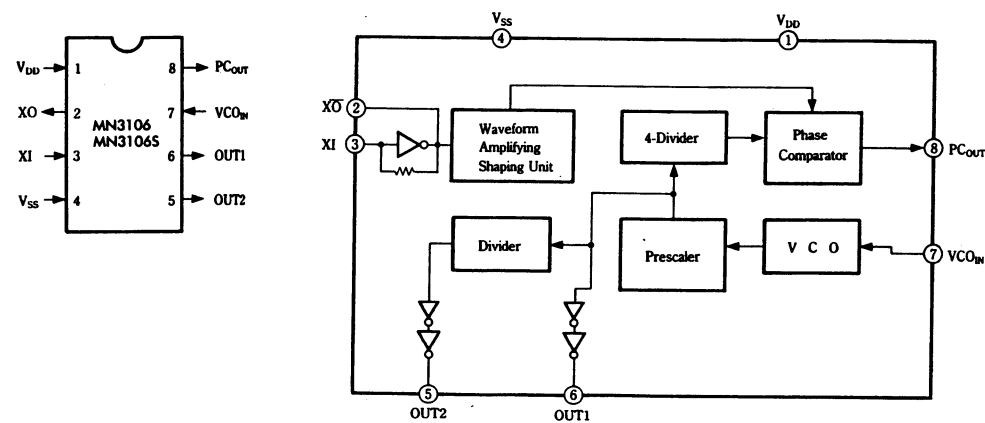
■ M5278L05M [MITSUBISHI]
(Three Terminal Negative Voltage Regulator)



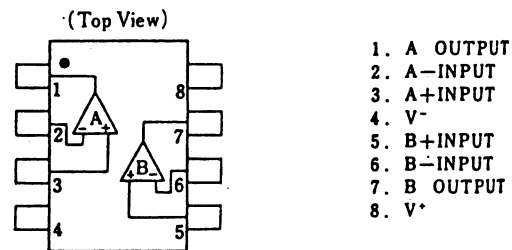
■ MB3782PF [FUJITSU]
(Switching Regulator Controller)



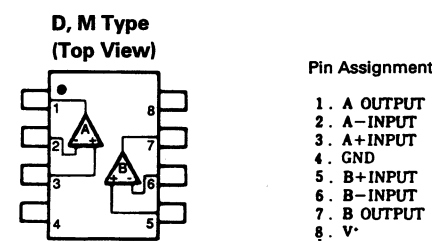
■ MN3106S [MATSUSHITA]
(Clock Pulse Generator)



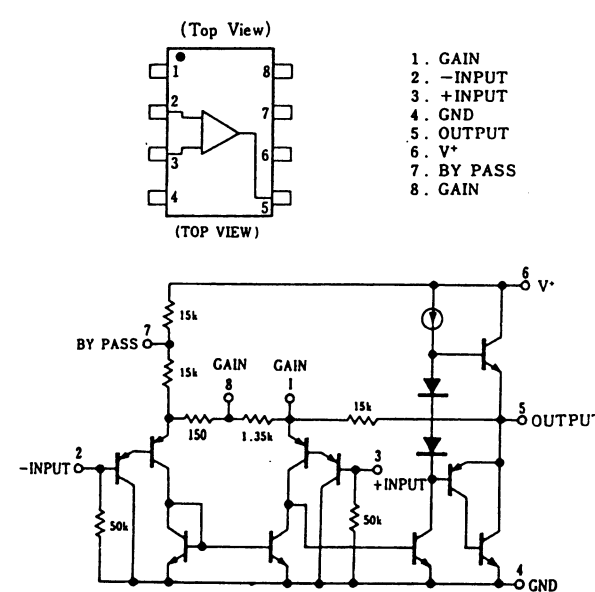
■ NJM2068MD [JRC]
(Dual Low-Noise Op.Amplifier)



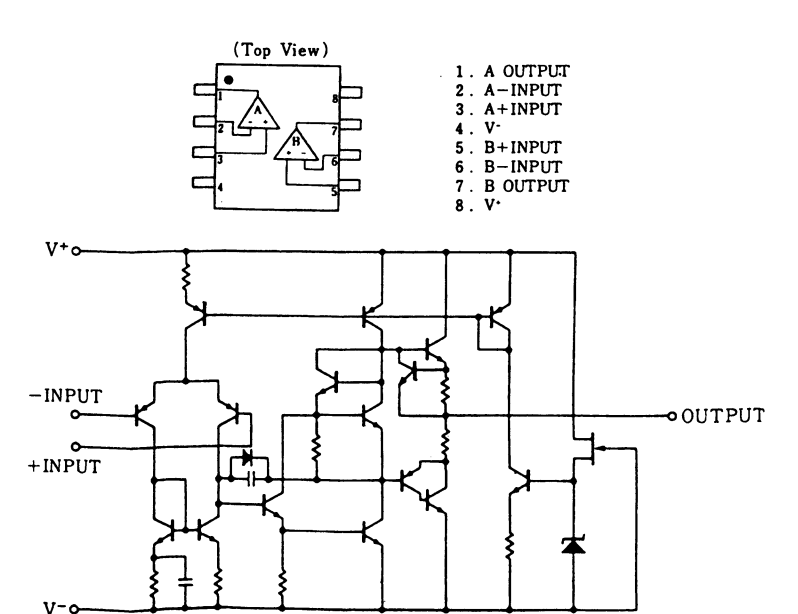
■ NJM2903M [JRC]
(Dual Single Supply Comparator)



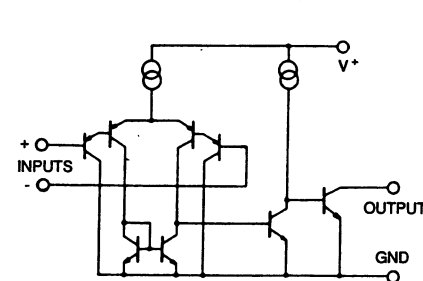
■ NJM386M [JRC]
(Low Voltage Audio Power Amplifier)



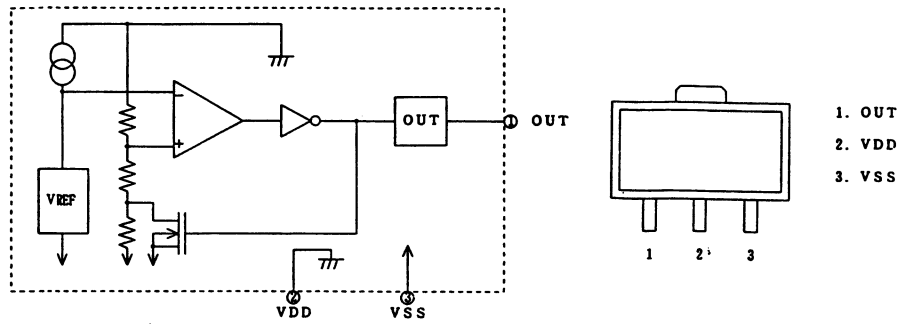
■ NJM4556MB [JRC]
(Dual High Current Op.Amplifier)



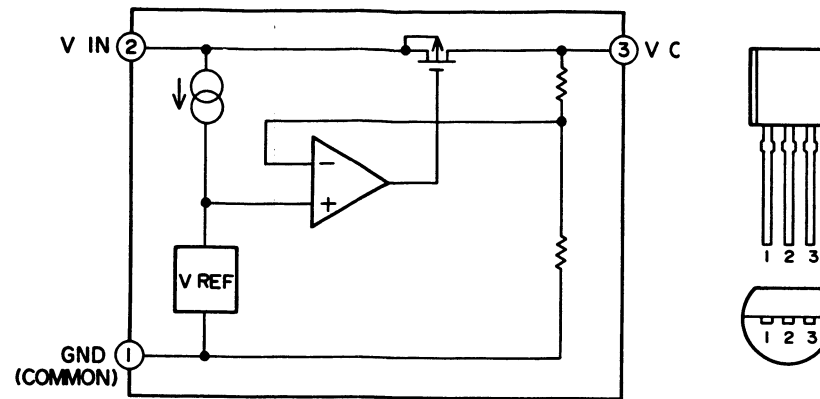
■ Equivalent Circuit (2 circuits in a chip)



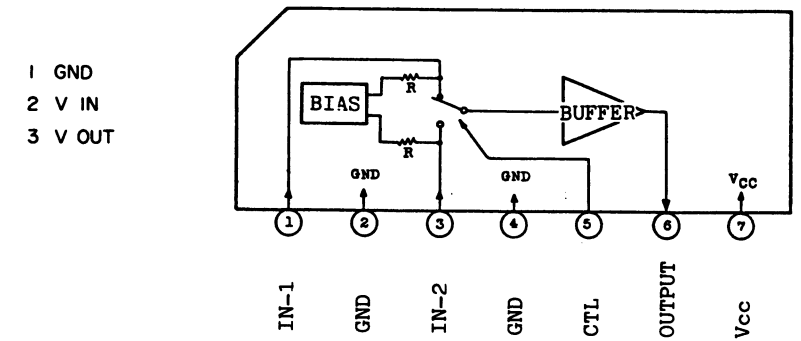
■ S-8054HN-CB-X [SEIKO]
(Voltage Detector)



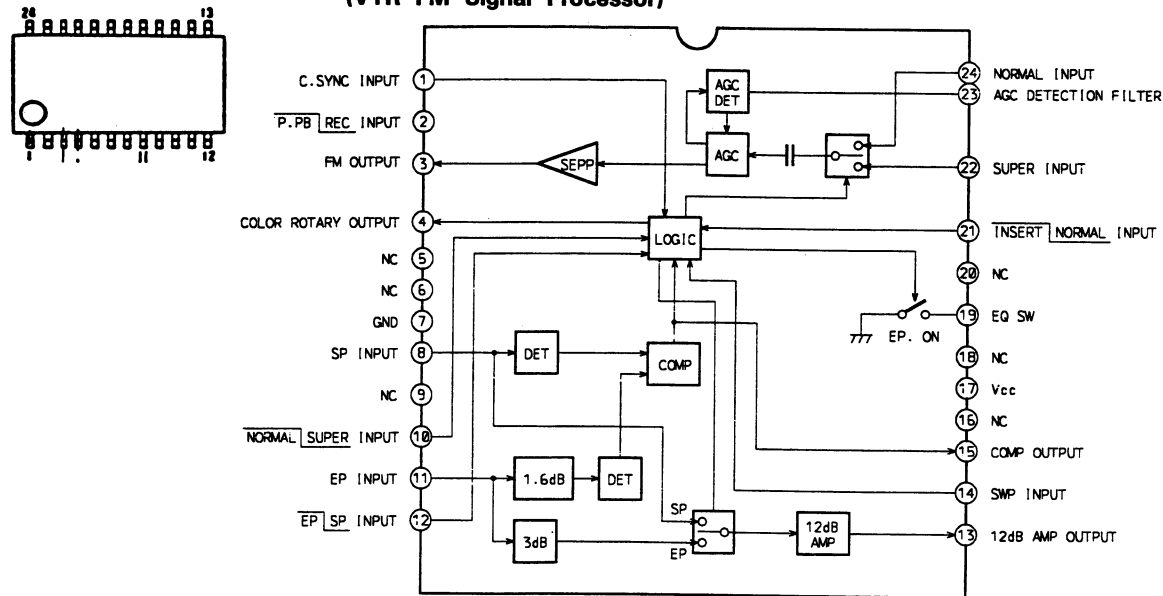
■ S-81252HG [SEIKO INSTRUMENTS]
(Voltage Detector)



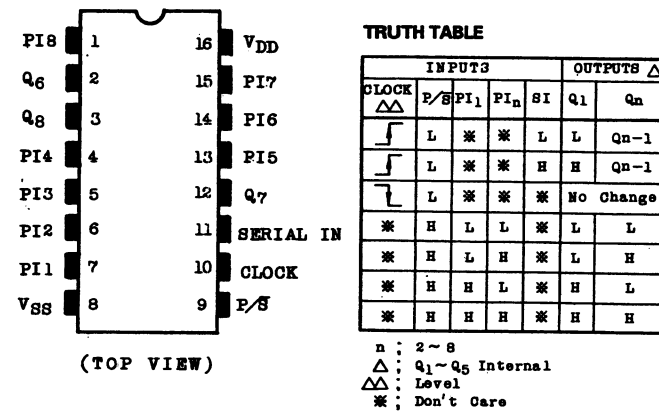
■ TA7347P [TOSHIBA]
(2-Input Switch)



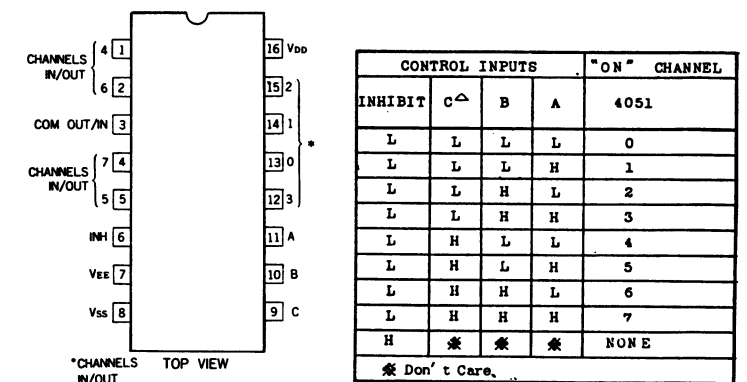
■ TA8733F [TOSHIBA]
(VTR FM Signal Processor)



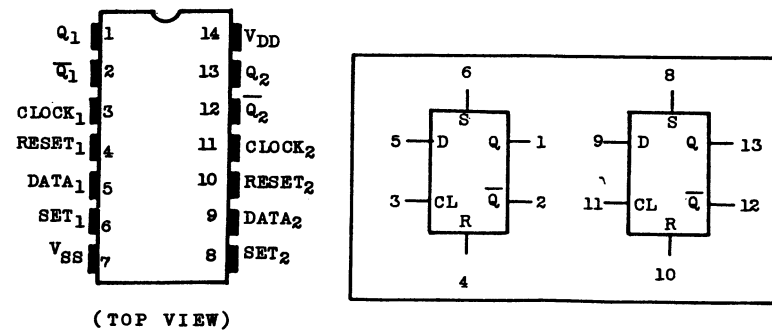
■ TC4021BF [TOSHIBA]
(8 Stage Static Shift Register)



■ TC4051BF [TOSHIBA]
(Single 8 Channel Analog Multiplexers/
Demultiplexers)



■ TC4013BF [TOSHIBA]
(Dual D-Type Flip Flop)

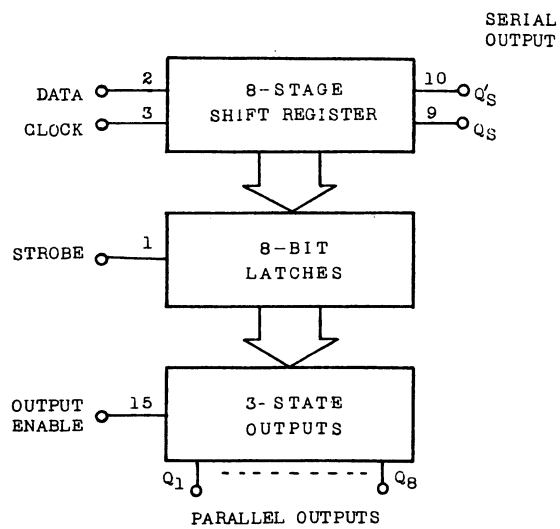
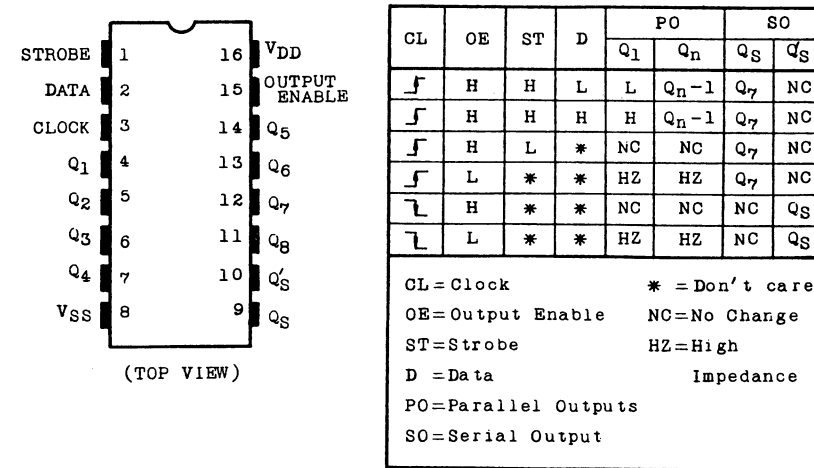


TRUTH TABLE

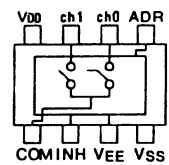
INPUTS				OUTPUTS	
RESET	SET	DATA	CLOCK	Qn+1	Qn+1
L	H	*	*	H	L
H	L	*	*	L	H
H	H	*	*	H	H
L	L	L	L	L	H
L	L	H	L	H	L
L	L	*	L	Qn*	Qn*

* : Don't Care
△ : Level Change
· : No Change

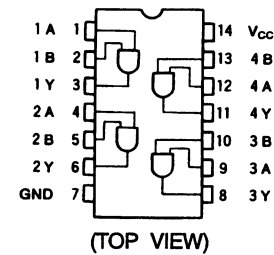
■ **TC4094BF** [TOSHIBA]
(8 Stage Bus Compatible Shift/Store Register)



■ **TC4W53F** [TOSHIBA]
(Multiplexer)



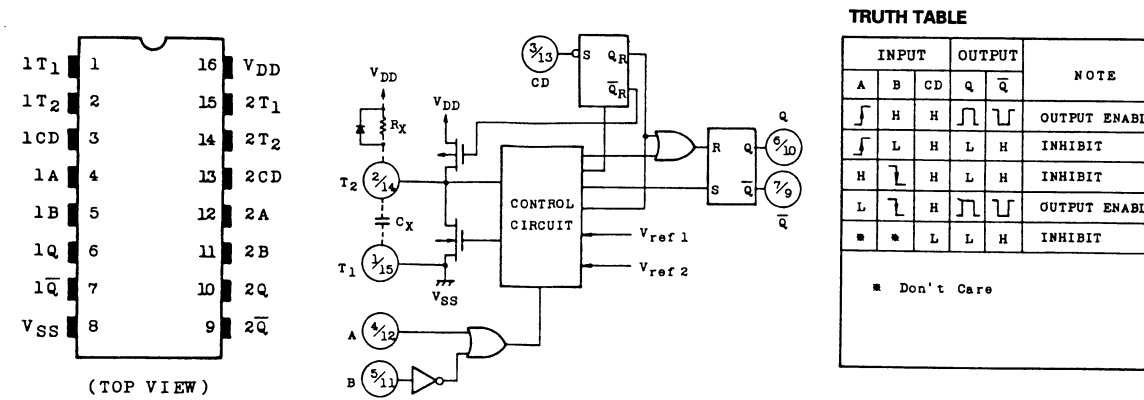
■ **TC74HC08AF** [TOSHIBA]
(Quad 2-Input AND Gates)



TRUE Table

A	B	Y
L	L	L
L	H	L
H	L	L
H	H	H

■ **TC4538BF** [TOSHIBA]
(Dual Precision Monostable Multivibrator)

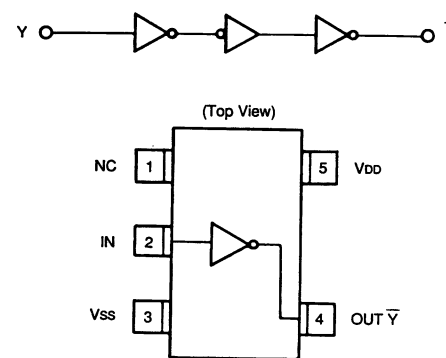


TRUTH TABLE

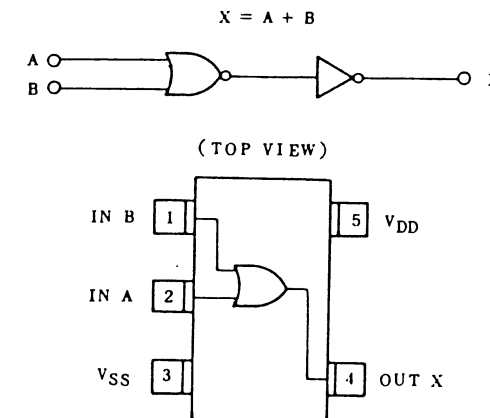
INPUT			OUTPUT		NOTE
A	B	CD	Q	Q-bar	
L	H	H	L	H	OUTPUT ENABLE
L	L	H	L	H	INHIBIT
L	H	L	L	H	INHIBIT
L	L	L	L	H	OUTPUT ENABLE
L	L	L	L	L	INHIBIT

* Don't Care

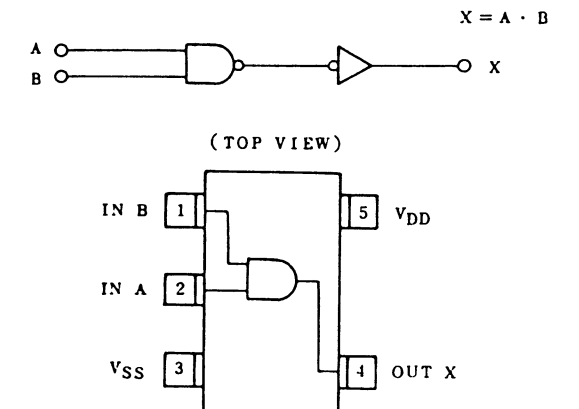
■ **TC4S69F** [TOSHIBA]
(Inverter Gate)



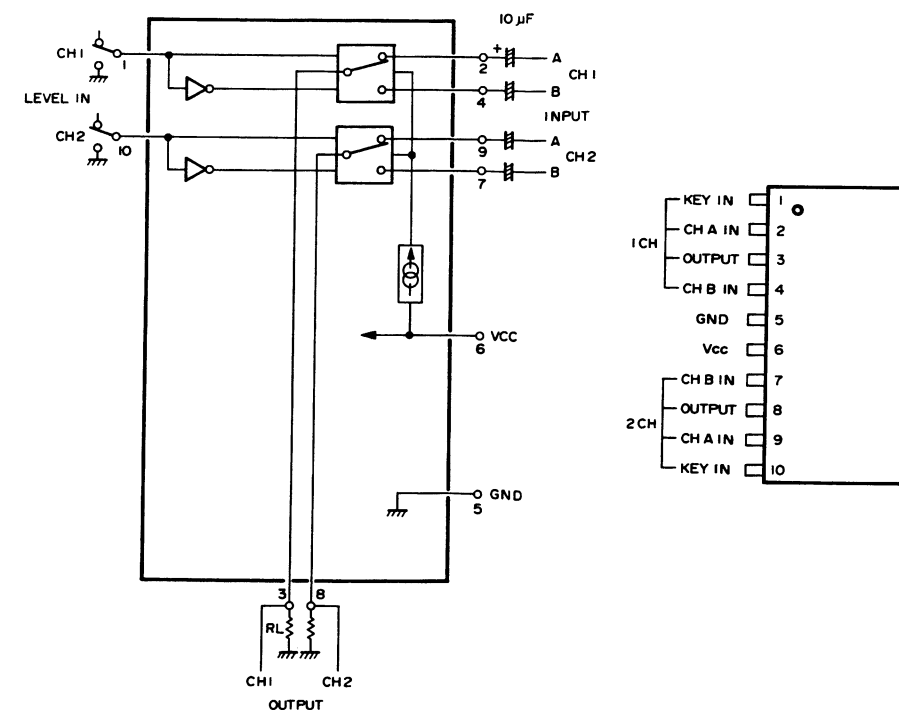
■ **TC4S71F** [TOSHIBA]
(2-Input OR Gate)



■ **TC4S81F** [TOSHIBA]
(2-Input AND Gate)



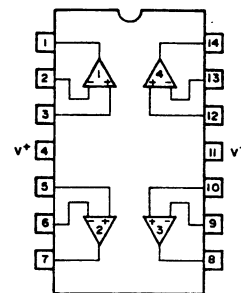
■ **TK15021** [TOKO-DENSHI]
(Analog Switch)



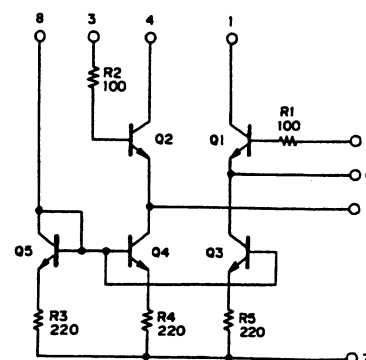
The block diagram illustrates the internal architecture of the 68000 microprocessor, organized into several functional blocks and their interconnections:

- Input/Output and Control:** Includes pins for *CLK70 SCLK*, *CSIN*, *H*, *V*, *2IH*, *H*, *V*, *2IH*, *XPRM0*, *XPRM1*, *LSH1*, *PHOUT*, *PHOIN*, *CA*, *CS*, *R1*, *R2*, *INH1*, *LX0*, *LX1*, *LSH0*, *SK0*, *SK0EN*, *LSB0*, *LS0*, *LS00*, *PORTA*, *PORTB*, *PORTC*, *PORTD*, *ISI*, *IS2*, *IS4*, and *TEST0* through *TEST12*.
- System Clock and Reset:** Features the **SYSTEM CLOCK** block receiving *CLK70 SCLK* and *108 109*, and the **SYSTEM RESET** block receiving *1* through *11*.
- Timing and Counter Blocks:** Includes the **TIMING GEN.** block, **TIME COUNTER**, **UB COUNTER**, **DATA LATCH**, **DATA INPUT CONTROL**, **DATA OUTPUT CONTROL**, **DATA MUX**, **CTL COUNTER**, **CTL ADDRESS GENE**, and **REAL TIME LATCH**.
- Control and Data Path:** Contains the **ADDRESS INPUT OUTPUT CONTROL**, **DATA SELECTOR**, **DATA LATCH**, **DATA INPUT CONTROL**, **DATA OUTPUT CONTROL**, **DATA MUX**, **CTL ADDRESS GENE**, and **REAL TIME LATCH**.
- Peripheral and Error Handling:** Includes the **LTC X1 DOMOD**, **ERROR BYPASS**, **SLAVE CHECK**, **TEST CIRCUIT**, and **TO COUNTER & ERROR BYPASS** block.
- Internal Registers and Buffers:** Shows various internal registers and buffers such as **SYNCH SEP, **FRAME DET., **VCD, **VITC DATA, **LTC DATA, **DATA MUX, **DATA LATCH, **DATA INPUT CONTROL, **DATA OUTPUT CONTROL, **DATA MUX, **CTL ADDRESS GENE**, and **REAL TIME LATCH**.********************
- Power and Ground:** Indicated by *+5V* and *Vcc* connections.

The diagram shows a complex network of signal paths connecting these blocks, with specific pin numbers and labels for each connection point.



The diagram shows a two-stage CMOS op-amp. The first stage is a differential pair with inputs V_{IN-} and V_{IN+} . The tail of this pair is connected to a tail current source (represented by a vertical line with a horizontal bar at the bottom) and a Miller compensation capacitor C_C . The output of the first stage is connected to the gates of the second stage, which is a common-source pair. The output of the second stage is V_{OUT} . The circuit is powered by V_{CC} and GND . Various biasing and compensation components, including current sources and capacitors, are used throughout the design.



SECTION 5

EXPLODED VIEWS AND PARTS LIST

SAFETY PRECAUTION

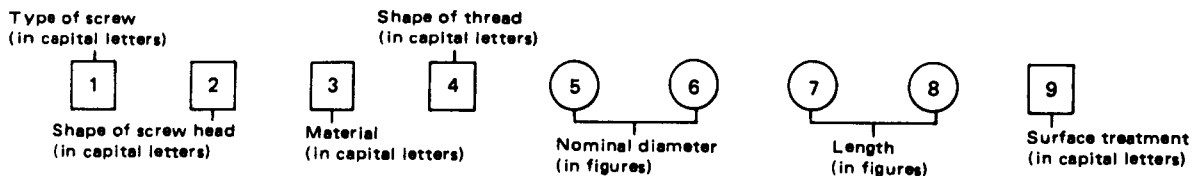
Parts identified by the \triangle symbol are critical for safety.
Replace only with specified part numbers.

	Page
5.1 STANDARD PART NUMBER CODING	
5.1.1 Screw coding	5 - 2
5.2 EXPLODED VIEWS AND PARTS LIST	
5.2.1 Packing assembly	5 - 3
5.2.2 Cabinet assembly	5 - 4
5.2.3 Chassis assembly	5 - 6
5.2.4 Mechanism assembly	5 - 8
5.2.5 Right side cover assembly	5-10
5.2.6 Connector box assembly	5-10
5.2.7 Battery holder assembly	5-12

5.1 STANDARD PART NUMBER CODING

5.1.1 Screw coding

Standard screw part numbers are as follows.

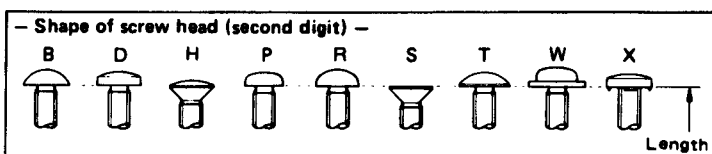
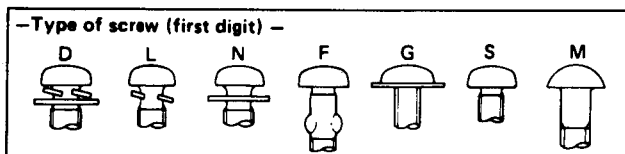


Type of screw (first digit)

- S Normal screws
- D Assembled machine screws (with plain and spring washers)
- L " (with spring washer)
- N " (with plain washer)
- F Feather screws
- G Washer head tapping screws
- M Wood screws

Shape of screw head (second digit)

- B Brazier head
- D Binding head
- H Oval countersunk head
- P Pan head
- R Round head
- S Flat head
- T Truss head
- W Washer head (machine screws)
- X Toothed head



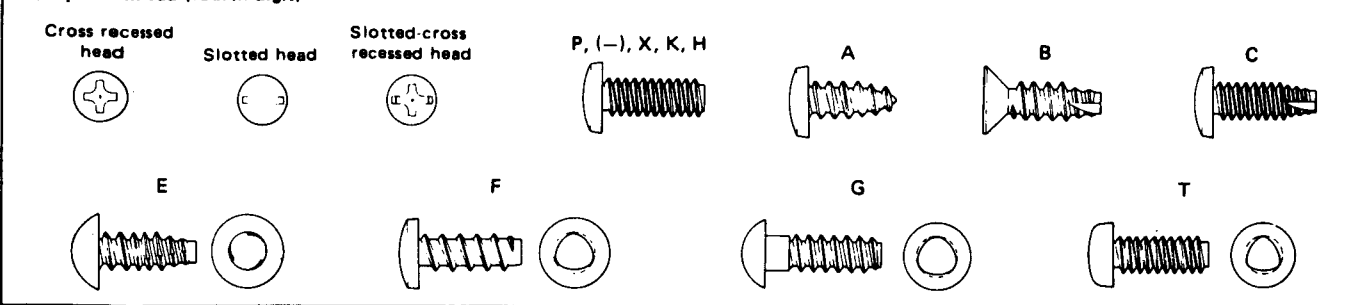
Material (third digit)

- S Steel
- E Stainless steel
- C Cast iron
- U Copper
- B Brass
- P Phosphor bronze
- N Nickel silver
- Y Cast brass
- A Aluminum
- Z Zinc alloy
- K Polycarbonate

Shape of thread (fourth digit)

- P Cross recessed head screws
- (-) Slotted head machine screws
- X Slotted-cross recessed head machine screws
- K Cross recessed head machine screws for precision equipment (type 1)
- H " (type 3)
- A Cross recessed head tapping screws (type 1)
- B " (type 2)
- C " (type 3)
- E Cross recessed head special tapping screws (brand : evertight)
- F " (brand : P-tight)
- T " (brand : taptight)
- G " (brand : taptight)

- Shape of thread (fourth digit) -



Nominal diameter (fifth and sixth digits)

The fifth and sixth digits are numbers indicating a nominal diameter or dimension. If the dimension exceeds 10 mm, three digits are used. The number indicates a nominal diameter or dimension, given in millimeters, multiplied by ten.

Surface treatment (ninth digit)

- Z Dichromate treatment after galvanizing (MFZn II-C)
- N Nickel plating (MFNi II, MFNi I)
- R Chromium plating (MBCr II, MBCr I)
- G Silver plating (SP4)
- B Black coating after plating
- F Blackening of iron (FB)
- M Blackening after galvanizing
- K Pickling of brass (PF2)
- P Phosphate treatment
- W Uni-chrome plating
- L Coating with transparent paint
- A Coloring red after galvanizing (MFZn II-C)
- C Coloring blue after galvanizing (MFZn II-C)
- T Coloring green after galvanizing (MFZn II-C)
- V Coloring purple after galvanizing (MFZn II-C)

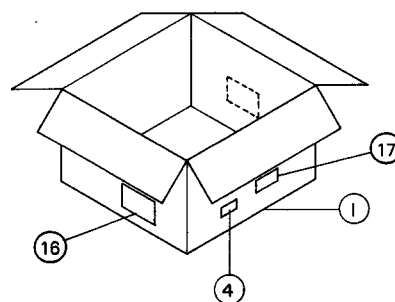
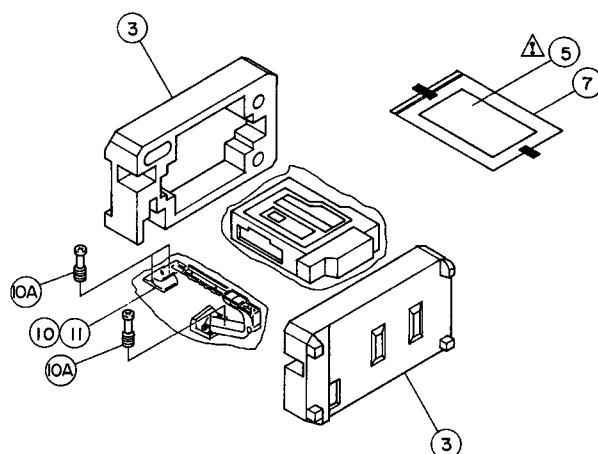
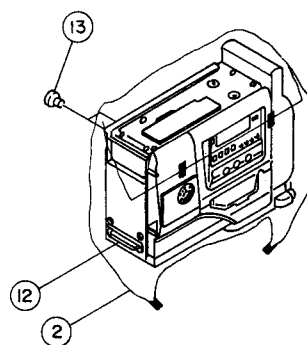
Length (seventh and eighth digits)

The seventh and eighth digits are numbers indicating length in millimeters. The preceding figure is zero when the dimension is smaller than 10 mm. For machine screws used in precision equipment whose length is given in units of 0.1 mm, the number indicates ten times the size of their length.

5.2 EXPLODED VIEWS AND PARTS LIST

5.2.1 Packing assembly **M** **1**

SW & VR Name	Position
• LIGHT SW	ON
• SELECT SW	COUNTER
• MONITOR LEVEL VR	CENTER
• AUDIO REC LEVEL VR's	CENTER
• V. OUTSEL SW	VTR
• REC TALLY SW	ON
• POWER SW	OFF
• TIME CODE GENERATOR SW's	
VTC SW	OFF
LTC SW	OFF
RUN SW	FREE
• RIGHT SIDE DOOR SW's	
MONITOR OUT SW	MIX
AUD OUT SW	Hi-Fi
AUD INPUT SELECT SW	
• 1/L (LEFT)	CAM
• 1/L (RIGHT)	+4
• 2/L (LEFT)	CAM
• 2/L (RIGHT)	+4
AEF SW	NORM
AUTO REVIEW SW	ON
S-VHS SW	AUTO
VIDEO OUT SW	NORMAL
REC LEVEL SW	MANU
Hi-Fi REC SW	ON
DOLBY NR SW	ON
TRACKING VR	CENTER



— Packing assembly list —

#△ REF No. PART No. PART NAME, DESCRIPTION

PACKING ASSEMBLY <M1>

1	PRD20430-02	PACKING CASE
2	PRD30077-02	POLY BAG
3	PRD20431A-01	CUSHION ASSY
4	PUP40619	SERIAL NO. STICKER, X2
△ 5	PGD30002-438-01	INSTRUCTIONS
7	QPG8024-03404	POLY BAG
10	PGS30196A-01	HANDLE ASSY
10A	SC43390-001	SCREW, X4
11	QPGA020-04505	POLY BAG
12	PGZ01280	DUST CAP
13	PGZ00782	CAP(A), X2
16	PRD30913-08	LABEL, X2
17	PRD43892-05	LABEL(PACKING), X2

5.2.2 Cabinet assembly M2

— Cabinet assembly list —

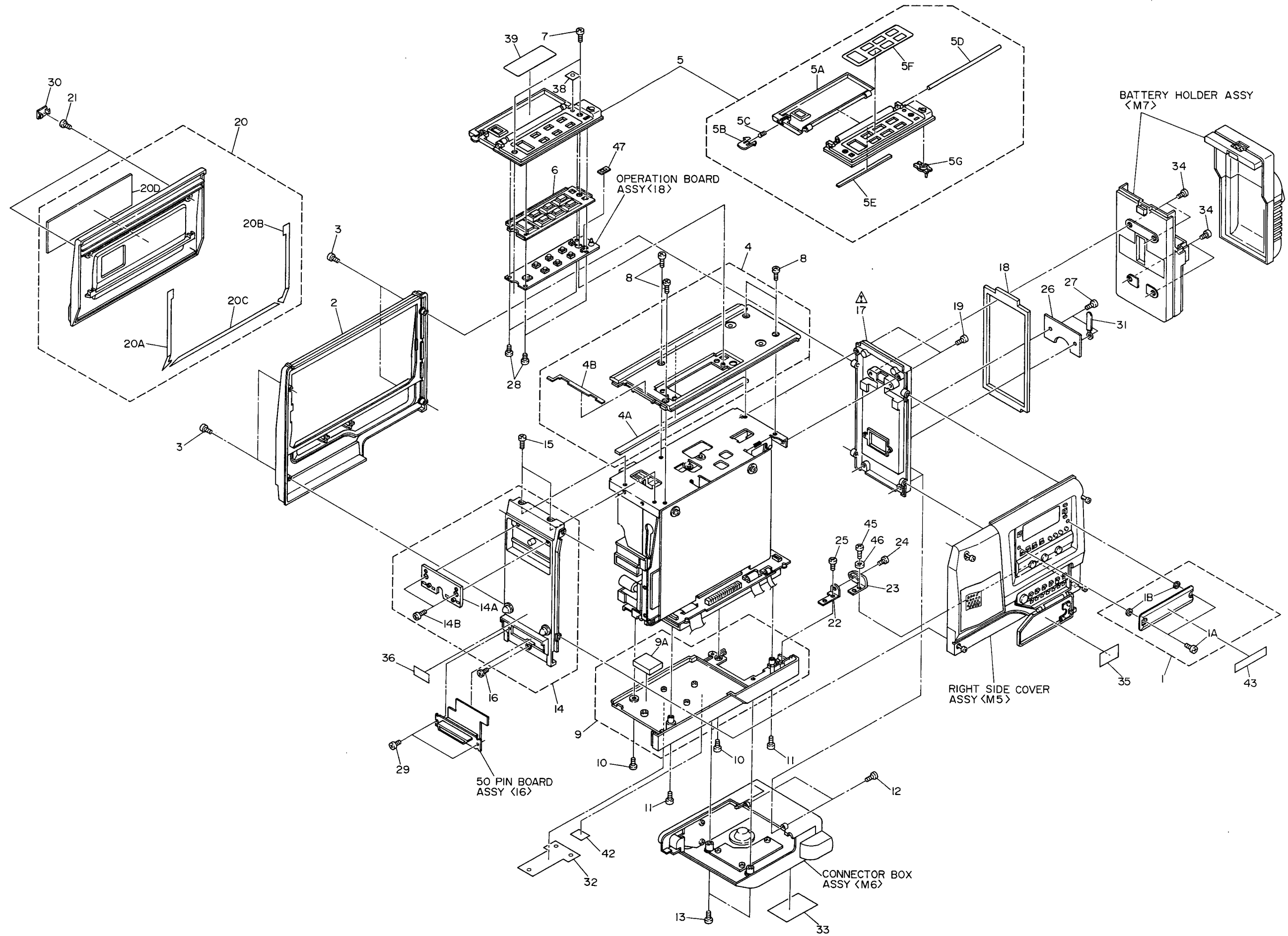
#	REF No.	PART No.	PART NAME, DESCRIPTION

CABINET ASSEMBLY <M2>

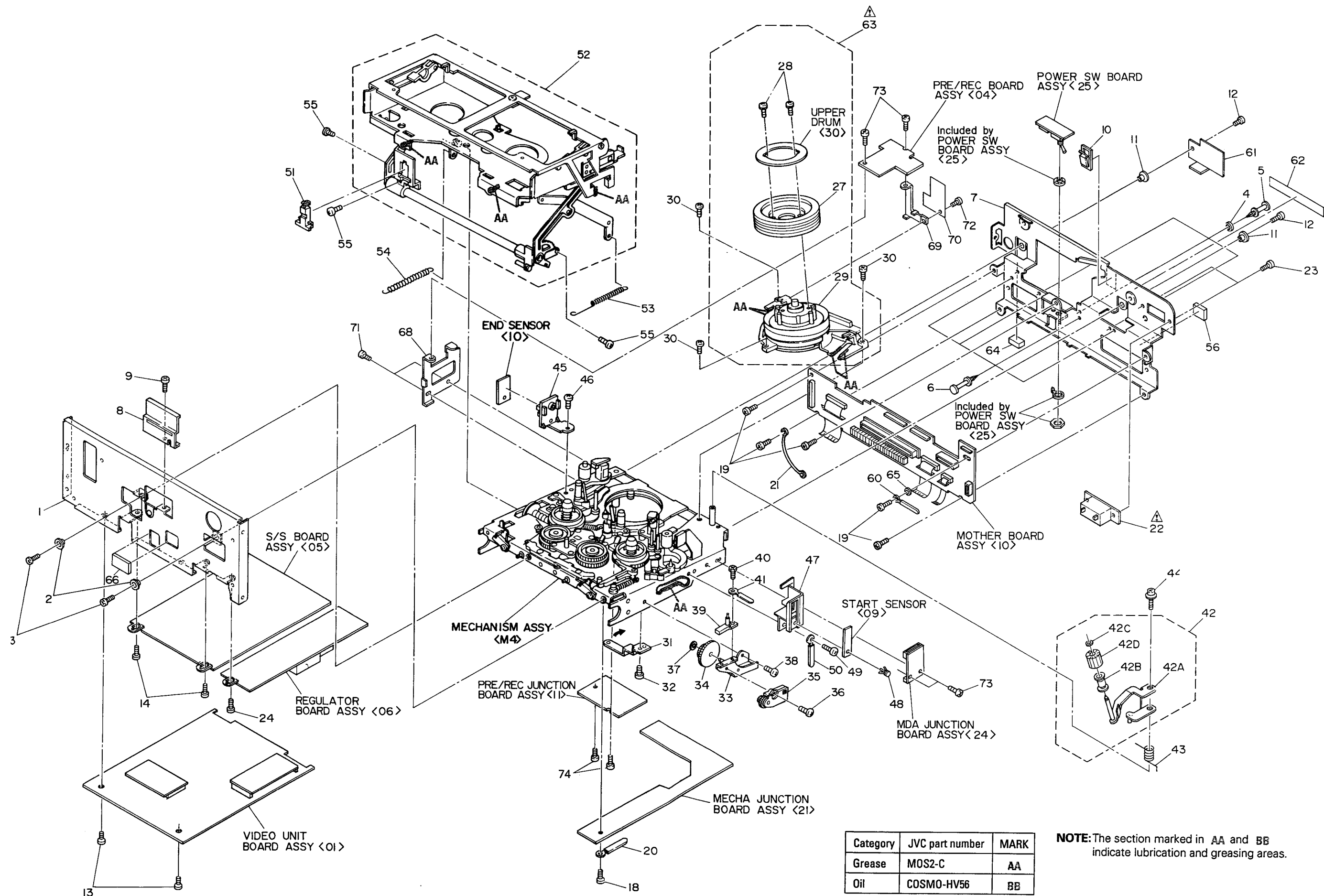
1	PRD44029A-01	COVER(T/C)ASSY
1A	PRD43457-03	SPECIAL SCREW, X2
1B	PRD44236	"E" RING, X2
2	PRD10303-01-04	SIDE COVER(L)
3	SC43397-010	SPECIAL SCREW, X4
4	PRD30964A-01	TOP COVER ASSY
4A	PRD30030-102	PAD
4B	PRD44081	PAD
5	PRD30897A-06	HOLDER ASSY
5A	PRD44012-01-02	DOOR
5B	PRD43840-01-04	KNOB(DOOR)
5C	PRD30023-53	COMPRESSION SPRING
5D	PRD43829-02	SHAFT
5E	PRD30030-99	PAD
5F	PRD43848-01-01	SHEET(OPE)
5G	PRD43827	INDICATOR
6	PRD30869-01-01	BUTTON(OPE)
7	SDSP2006M	SCREW, X2
8	SDSP3008M	SCREW, X4
9	PRD30977A-02	BOTTOM COVER ASSY
9A	PRD30030-108	PAD
10	SDSP3008M	SCREW, X2
11	SDSP3014M	SCREW, X2
12	SDSP3008M	SCREW, X2
13	SDSP3014M	SCREW, X2
14	PRD20434A-05	FRONT COVER ASSY
14A	SC30988-003	CAMERA GUIDE
14B	SDSP3008M	SCREW, X2
15	SDSP4008M	SCREW, X2
16	SDSP3008M	SCREW
△ 17	PRD30931-01-06	REAR PANEL
18	PRD43915-01-01	PAD
19	SDSP3008M	SCREW, X2
20	PRD20465D-06	CASSETTE PANEL ASSY
20A	PRD43849-01-02	SHEET(A)
20B	PRD43849-02-02	SHEET(A)
20C	PRD43850	SHEET(B)
20D	PRD30896-04	WINDOW
21	SDSP2606M	SCREW, X2
22	PRD44191	BRACKET(HINGE)
23	PRD44192	ARM
24	PRD44099	SPECIAL SCREW
25	LPSP2606Z	SCREW
26	PRD44055	INSULATOR
27	SDSP2006Z	SCREW, X2
28	SDSF2004Z	SCREW, X4
29	LPSP2006Z	SCREW, X2
30	PRD44259	CAP ,X2
31	PU49485-4	WIRE CLAMP
32	PRD30957	PLATE
33	PRD30087-08	SERIAL NO.PLATE
34	SDSP3008M	SCREW, X4

#	REF No.	PART No.	PART NAME, DESCRIPTION
---	---------	----------	------------------------

35	PRD44027	LABEL
36	PRD42985-02	LABEL
38	PRD44120	LABEL(OPE)
39	PRD44118	CAUTION LABEL
42	PRD43307	STICKER
43	PRD44158-02	LABEL(DISPLAY)
45	YQM30032-49	SCREW
46	WLS2600N	L.WASHER
47	PRD44280	PLATE(KNOB)



5.2.3 Chassis assembly M 3



Category	JVC part number	MARK
Grease	MOS2-C	AA
Oil	COSMO-HV56	BB

NOTE: The section marked in AA and BB indicate lubrication and greasing areas.

— Chassis assembly list —

#△ REF No. PART No. PART NAME, DESCRIPTION

CHASSIS ASSEMBLY <M3>

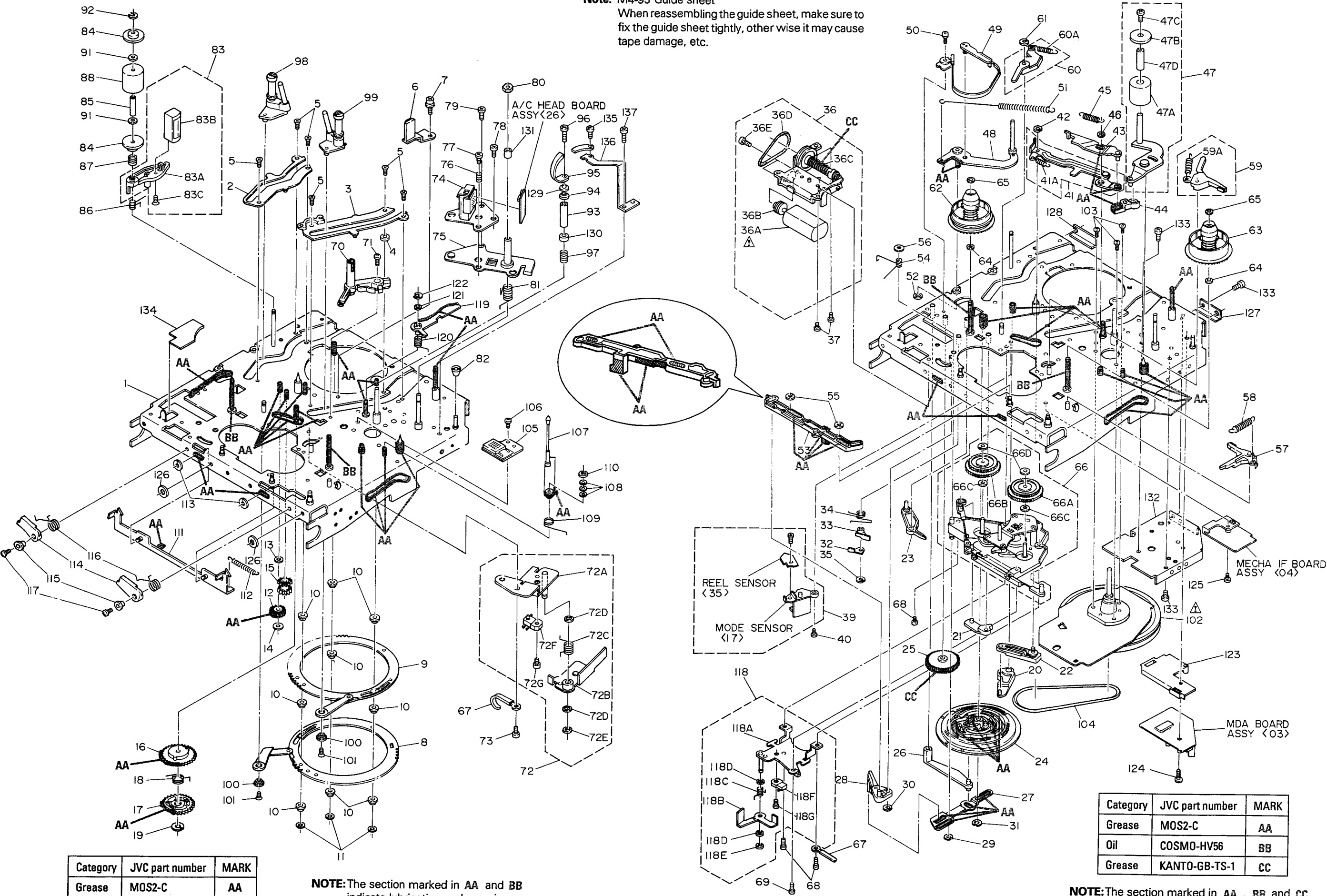
1	PRD30868-01-02	FRAME(TOP)
2	PRD43914-01-01	SPACER, X2
3	PRD30093	SPECIAL SCREW, X2
4	PRD30084	WASHER, X3
5	PU60010-5	SPACER, X3
6	PU60010-3	SPACER, X4
7	PRD30865-01-04	FRAME(BOTTOM)
8	YQ41954-1-2	BRACKET(GUIDE)
9	SDST2605Z	SCREW
10	PGZ01086	FLAT CABLE CLIP
11	PRD43914-01-01	SPACER, X2
12	PRD30093	SPECIAL SCREW, X2
13	PRD44050-02	SCREW, X2
14	PRD44050-02	SCREW, X2
18	SDSP2606Z	SCREW
19	SDST2605Z	SCREW, X5
20	PU49485-3	WIRE CLAMP
21	PRD44017	STRING
△ 22	PGZ01849	BREAKER
23	SPSP3006Z	SCREW, X2
24	PRD44050-02	SCREW
27	PRD20443D	UPPER DRUM ASSY
28	PDM4165A	DRUM SCREW ASSY, X2
29	PRD20444B	LOWER DRUM MOTOR ASSY
30	SDSP2606Z	SCREW, X3
31	YU40548-1-1	BRUSH
32	SDST2005Z	SCREW
33	YQ40636A-3	DAMPER BRACKET ASSY
34	YQ40298	DAMPER GEAR
35	PU56781	DAMPER
36	SDSP2006Z	SCREW
37	PQM30017-23	SLIT WASHER
38	SDST2606Z	SCREW
39	YU40148-1-1	CASSETTE SWITCH
40	SDSP2605Z	SCREW
41	PU49485-3	WIRE CLAMP
42	PRD43820A	CLEANER ARM ASSY
42A	PRD43821A	CLEANER ARM SUB ASSY
42B	PQ45689	ROLLER
42C	PQM30017-38	SLIT WASHER
42D	PQ44837	CLEANER
43	PRD43718	TORSION SPRING
44	DPSP2005Z	SCREW
45	YQ30216-1-3	END SENSOR BRACKET
46	SDST2605Z	SCREW
47	PRD30845	START SENSOR BRACKET
48	PU56800	NYLON RIVET
49	SDST2606Z	SCREW
50	PU49485-3	WIRE CLAMP
51	PU56571	LEAF SWITCH,REC SAFETY
52	PRD20469A	CASSETTE HOUSING ASSY

#△ REF No. PART No. PART NAME, DESCRIPTION

53	YQM30001-27	TENSION SPRING
54	PRD30024-66	TENSION SPRING
55	SDST2606Z	SCREW, X3
56	PRD30030-28	PAD
60	PU49485-3	WIRE CLAMP
61	PRD44138-01-01	INSULATOR
62	PRD44046-02	LABEL
△ 63	PDV2308A	DRUM ASSY
64	PRD44188	PAD
65	PQM30017-6	SLIT WASHER
66	PRD30030-107	PAD
68	PRD44216	BRACKET(A)
69	PRD44217	BRACKET(B)
70	PRS40035-01-01	SHIELD PLATE
71	SDST2606Z	SCREW, X2
72	LPSP2606Z	SCREW
73	SDST2605Z	SCREW, X4
74	SDSP2606Z	SCREW, X2

5.2.4 Mechanism assembly M4

Note: M4-95 Guide sheet
When reassembling the guide sheet, make sure to fix the guide sheet tightly, other wise it may cause tape damage, etc.



Category	JVC part number	MARK
Grease	MOS2-C	AA
Oil	COSMO-HV56	BB

NOTE:The section marked in AA and BB indicate lubrication and greasing areas.

Category	JVC part number	MARK
Grease	MOS2-C	AA
Oil	COSMO-HV56	BB
Grease	KANTO-GB-TS-1	CC

NOTE:The section marked in AA , BB and CC indicate lubrication and greasing areas.

— Mechanism assembly list —

#△ REF No. PART No. PART NAME, DESCRIPTION

MECHANISM ASSEMBLY <M4>

1	PRD20418A-06	MAIN DECK ASSY
2	YQ30569	GUIDE RAIL(S)
3	YQ30487	GUIDE RAIL(T)
4	Q03093-827	SPACER
5	PQ41269-2	SPECIAL SCREW, X6
6	PRD30287-01-03	TAPE GUIDE
7	SDSP2605Z	SCREW
8	YQ41229A-1	LOADING RING ASSY (S)
9	YQ41232A-1	LOADING RING ASSY (T)
10	PQ42786	GUIDE ROLLER, X9
11	PQM30017-22	SLIT WASHER, X3
12	PQ40822	CONNECT GEAR 1
13	Q03093-817	SPACER
14	PQM30017-24	SLIT WASHER
15	PQ40823	CONNECT GEAR 2
16	PQ31597	LOADING GEAR 1
17	PQ30337	LOADING GEAR 2
18	PQ41069	TORSION SPRING
19	PQM30017-18	SLIT WASHER
20	PQ42787	CAM LEVER 1
21	PQ40827	CAM LEVER 2
22	PQ42788A	RELAY ARM ASSY
23	PQ40831A-1	CANCEL LEVER ASSY
24	PQ20235-1-3	CONTROL CAM
25	PQ40833	WORM WHEEL
26	PQ40834A	CANCEL LEVER 3 ASSY
27	PQ40836-1-2	SLIDE PLATE
28	PQ40837B	RELAY LEVER ASSY
29	PQM30017-22	SLIT WASHER
30	PQM30017-23	SLIT WASHER
31	REE2500	"E" RING
32	PQ41225-1-2	CAM BRAKE 1
33	PQ41226	CAM BRAKE 2
34	PQ41252-2-2	TORSION SPRING
35	PQM30017-23	SLIT WASHER
36	PGZ01830-02	MOTOR BRACKET ASSY
△ 36A	PGZ01939	LOADING MOTOR
36B	PRD44262	MOTOR PULLEY
36C	PGZ01831-02	MOTOR BRACKET UNIT
36D	PRD30022-19	LOADING BELT
36E	SDSP2004M	SCREW, X2
37	SDST2605Z	SCREW, X2
39	PGS30043B	MODE SENSOR ASSY
40	SDSP2605Z	SCREW
41	YQ30489A-1	PINCH ROLLER PLATE ASSY
41A	PQM30001-153	TENSION SPRING
42	PQM30017-23	SLIT WASHER
43	YQ41270A	TOGGLE ARM ASSY
44	PQ40844	TOGGLE ARM 2
45	YQ41237	TENSION SPRING
46	REE2500	"E" RING
47	PQ40874A-2	PINCH ROLLER ARM ASSY
47A	PQ41125A	PINCH ROLLER ASSY
47B	PU53878	PINCH ROLLER CAP
47C	SPSP2005Z	SCREW
47D	PQM30005-39	COLLAR
48	PRD43771A-03	TENSION POLE ASSY
49	PQ40851B	TENSION BAND ASSY

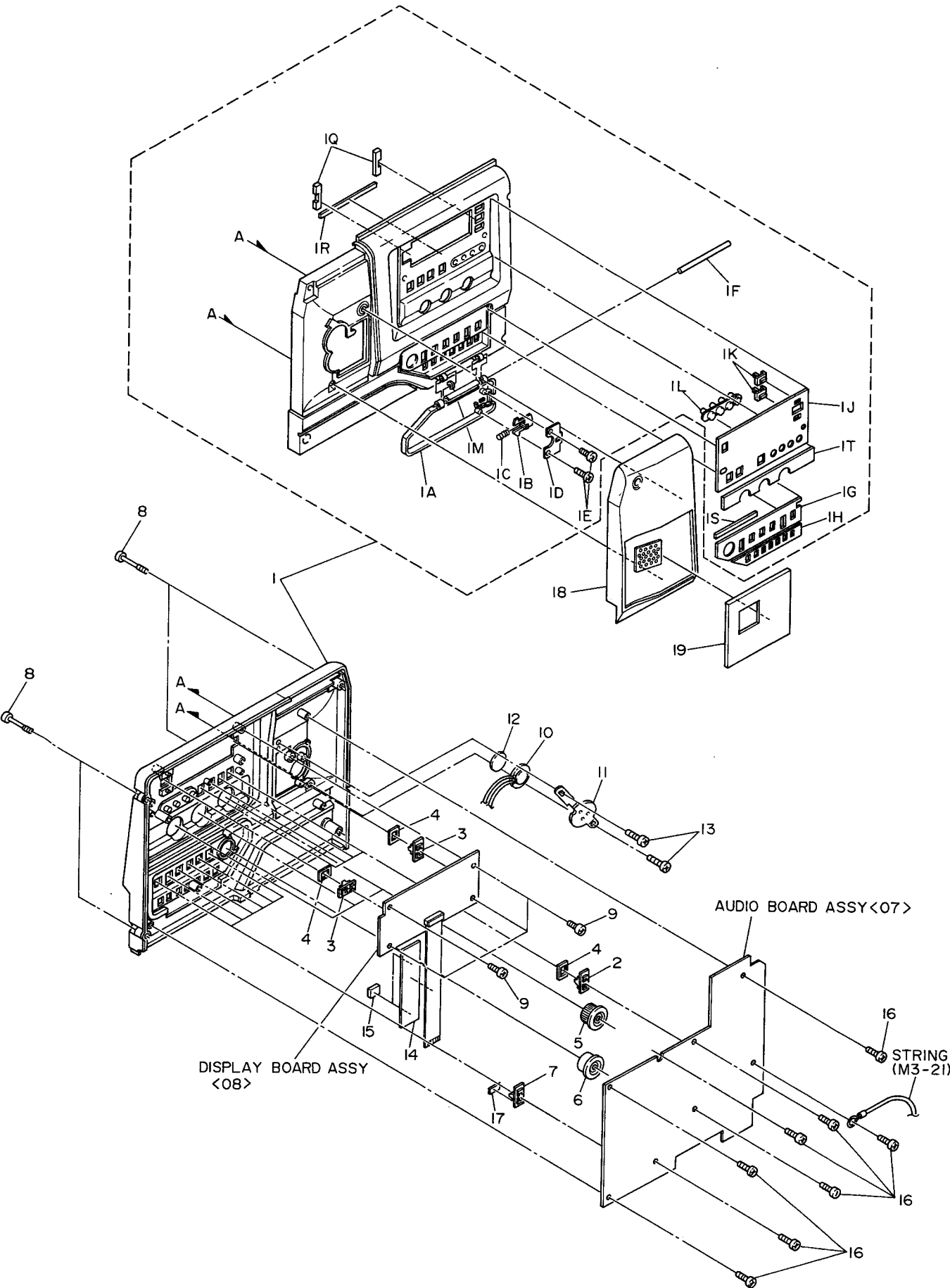
#△ REF No. PART No. PART NAME, DESCRIPTION

50	SDSP2605Z	SCREW
51	PRD44003	TENSION SPRING
52	REE2000	"E" RING
53	PQ30269-2	CONTROL PLATE
54	PRD44154	TORSION SPRING
55	PQM30017-22	SLIT WASHER, X2
56	PQM30017-23	SLIT WASHER
57	PQ40858B	SEARCH BRAKE ASSY
58	PQM30001-222	TENSION SPRING
59	PQ40860B-3	REW BRAKE ASSY
59A	YQM30001-21-4	TENSION SPRING
60	PRD44028A	FF BRAKE ASSY
60A	PRD30024-61	TENSION SPRING
61	PQM30017-24	SLIT WASHER
62	PGZ01341	REEL DISK (SUPPLY)
63	PGZ01342	REEL DISK (TAKE-UP)
64	Q03093-828	WASHER, X2
65	PQM30017-26	SLIT WASHER, X2
66	PGZ01833	CLUTCH HECHANISM ASSY
66A	PU56650-1-4	TAKE-UP CLUTCH
66B	YU40427	SUPPLY CLUTCH
66C	Q03093-827	SPACER, X2
66D	PQM30017-2	SLIT WASHER, X2
67	PU49485-3	WIRE CLAMP, X2
68	SDST2610Z	SCREW, X3
69	SDSP2608Z	SCREW
70	PUS37229C	CASSETTE LED ASSY
71	SDST2605Z	SCREW
72	PGS30179A	AL SW ASSY
72A	PRD43723A	AL SW BRACKET ASSY
72B	PRD42599A	AL SW LEVER ASSY
72C	PRD42600	TORSION SPRING
72D	Q03093-831	WASHER, X2
72E	REE2000	"E" RING
72F	PGZ00503	INSERT SW
72G	SDSP2006Z	SCREW
73	SDSP2604Z	SCREW
74	PGZ01675	AUDIO/CONTROL HEAD
75	PRD43710A	HEAD ARM ASSY
76	PQM30002-197	COMPRESSION SPRING
77	SDSP2612Z	SCREW
78	PQ44621	SPECIAL SCREW
79	PQ43687B	SPECIAL SCREW
80	NTS4000ZS	NUT
81	PQ44119	TORSION SPRING
82	PQ45181	TAPER NUT
83	PRD43795A-01	FE HEAD ASSY
83A	PRD30860-01-02	FE HEAD ARM
83B	PU60646	FULL ERASE HEAD
83C	SSSK2050M	SCREW
84	PQ42804	LOWER FLANGE, X2
85	PRD44136-01-01	COLLAR
86	PQ42806	TORSION SPRING
87	PQM30002-189	COMPRESSION SPRING
88	PRD44135-01-01	IMPEDANCE ROLLER
91	Q03093-831	WASHER, X2
92	REE1500	"E" RING
93	PRD43733	TAPE GUIDE
94	PRD44270	GUIDE FLANGE
95	PRD44112-01-02	GUIDE SHEET

#△ REF No. PART No. PART NAME, DESCRIPTION

96	PRD43165	SPECIAL SCREW
97	PRD30023-30	COMPRESSION SPRING
98	YQ40653B	POLE BASE ASSY(SUPPLY)
99	YQ40509D	POLE BASE ASSY(TAKE-UP)
100	PQ40872	SPACER, X2
101	PQ41269	SPECIAL SCREW, X2
△ 102	PGZ01728-01-01	CAPSTAN MOTOR
103	SDSP2604Z	SCREW, X3
104	PQM30003-12	REEL BELT
105	PU61315	DEW SENSOR
106	SPSH1725M	SCREW
107	PQ40993B	TU GUIDE ASSY
108	PQM30018-33	WASHER, X3
109	PQ40994-1-2	TORSION SPRING
110	REE2500	"E" RING
111	PQ31604A-8	LOCK PLATE ASSY
112	YQM30001-26-5	SPRING
113	PQM30017-32	SLIT WASHER, X2
114	YQ40833-1-1	CANCEL LEVER, X2
115	PQM30013-10	FLANGE COLLAR, X2
116	PQ42817	TORSION SPRING, X2
117	SDST2608Z	SCREW, X2
118	PGS30181A	LOCK SW ASSY
118A	PRD43725A	LOCK SW BRACKET ASSY
118B	PRD43726A	LOCK SW LEVER ASSY
118C	PRD43717	TORSION SPRING
118D	Q03093-831	WASHER, X2
118E	REE2000	"E" RING
118F	PGZ00503	INSERT SW
118G	SDSP2006Z	SCREW
119	PRD43751A	RELEASE ARM ASSY
120	PRD43757	TORSION SPRING
121	Q03093-825	WASHER
122	REE2500	"E" RING
123	YQ40637-1-1	MDA HOLDER
124	SDST2612Z	SCREW
125	SDST2610Z	SCREW
126	PRD30084-03	WASHER, X2
127	PRD44056-03	INSULATOR
128	PRD44056-04-01	INSULATOR
129	PRD43675	COLLAR
130	PRD44094	GUIDE FLANGE
131	PRD30026-41	COLLAR
132	PRD44143	CORNER BRACKET
133	SDSP2604Z	SCREW, X3
134	PRD43768	COVER
135	SPSH1730M	MINI SCREW
136	PRD44272	BRACKET
137	SDST2605Z	SCREW

5.2.5 Right side cover assembly M5



— Right side cover assembly list —

#	△ REF No.	PART No.	PART NAME, DESCRIPTION

RIGHT SIDE COVER ASSEMBLY <M5>			
1		PRD10293C-09	SIDE COVER(R) ASSY
1A		PRD30935-01-01	DOOR
1B		PRD43840-01-04	KNOB(DOOR)
1C		PRD30023-53	COMPRESSION SPRING
1D		PRD43917	PLATE
1E		YQM30054-9	SCREW, X2
1F		PRD43829	SHAFT
1G		PRD43830-01-03	SHEET(DOOR1)
1H		PRD43918-01-02	SHEET(DOOR2)
1J		PRD43832-02-04	SHEET(DISPLAY)
1K		PRD43831-01-02	BUTTON(COUNTER), X2
1L		SC44557	TIME CODE CAP
1M		Q03093-828	WASHER
1Q		PRD44169	SHADE
1R		PRD30030-100	PAD
1S		PRD30030-103	PAD
1T		PRD43834-01-01	SHEET(VR)
2		SC44556-002	KNOB(T/C), X4
3		PRD44020	KNOB(T/C), X2
4		PRD43146-02	KNOB PLATE, X6
5		PRD43839-01-03	KNOB(VR), X3
6		PQ44237-3	KNOB(VR)
7		PRD43835	KNOB(OPE), X6
8		SC43397-010	SPECIAL SCREW, X4
9		SDSP2606Z	SCREW, X4
10		PGZ01282	SPEAKER
11		PRD44119-01-01	SPEAKER BRACKET
12		PRD30030-105	PAD
13		SDSF2606Z	SCREW, X2
14		PRD44067-01-01	INSULATOR
15		PRD42674	PAD, X2
16		YQM30032-49	SCREW, X8
17		PRD42909-04	PLATE, X6
18		PRD10281-01-03	COVER(CHEEK)
19		PRD43838-01-01	PAD(CHEEK)

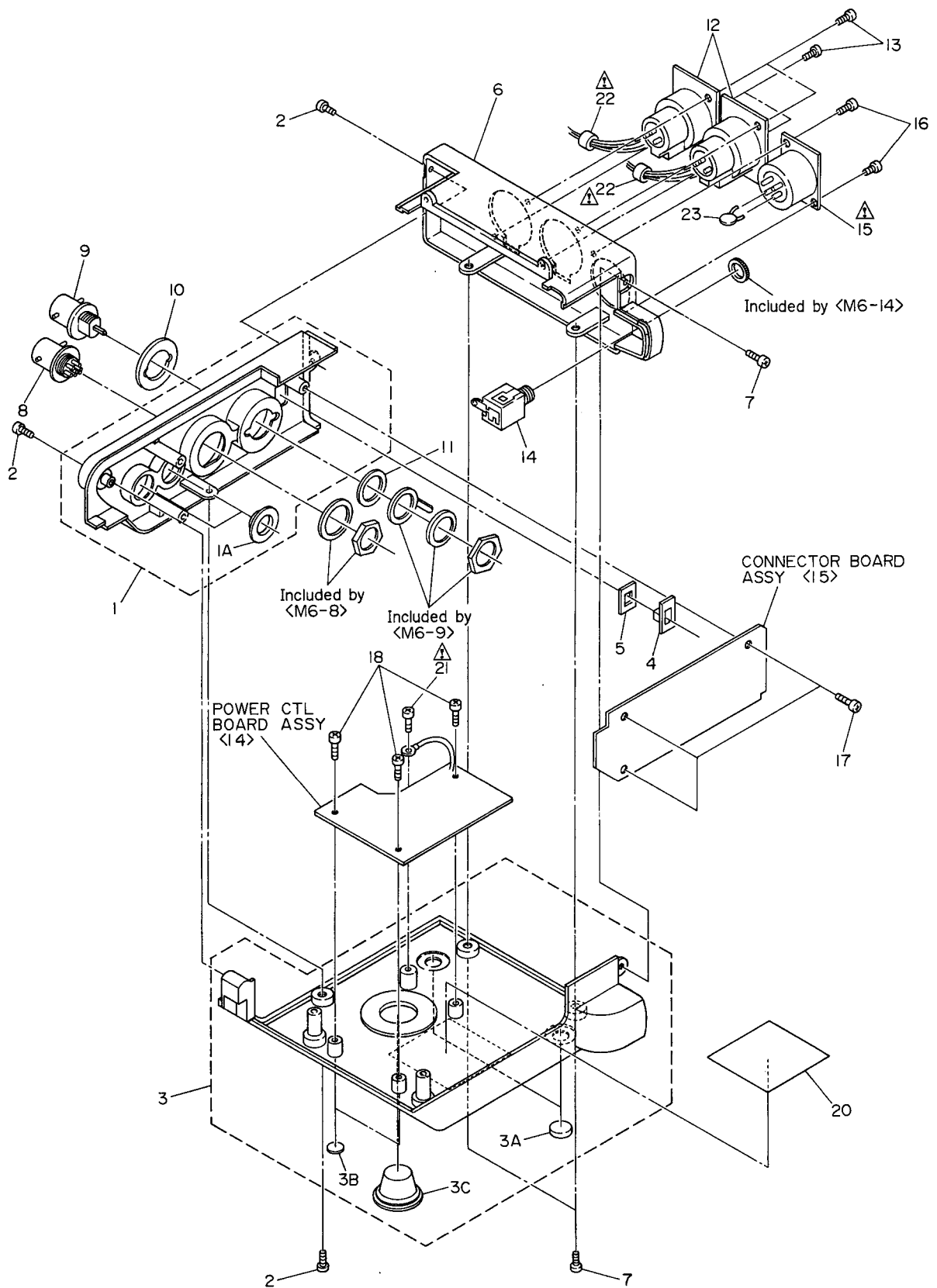
5.2.6 Connector box assembly M6

— Connector box assembly list —

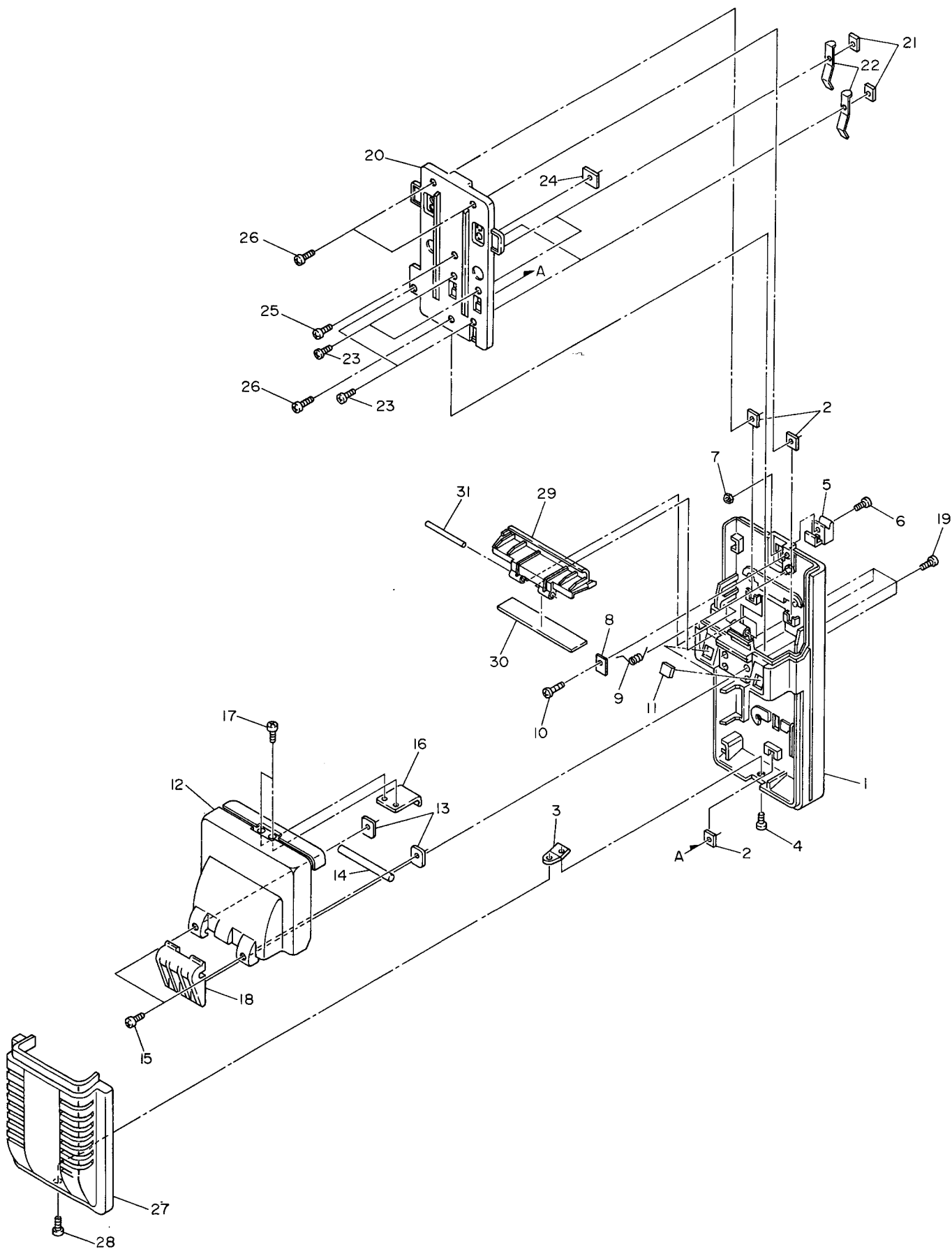
#	△ REF No.	PART No.	PART NAME, DESCRIPTION

CONNECTOR BOX ASSEMBLY <M6>			
1		PRD30874A-03	CONNECTOR BOX(L)ASSY
1A		PRD42906	RCA ESCUTCHEON, X2
2		SDSP2606M	SCREW, X3
3		PRD30875A-03	CONNECTOR BOX(B)ASSY
3A		PRD30090	FOOT, X2
3B		PRD43134	BLIND SHEET, X2
3C		PRD43847	CAP(BRAKER)
4		PRD42830	SLIDE KNOB
5		PRD43146-03	KNOB PLATE
6		PRD20422-02-08	CONNECTOR BOX(R)
7		SDSP2606M	SCREW, X3
8		PGZ00593	7P CONNECTOR
9		PGZ00440	BNC CONNECTOR
10		PU48611	RING
11		Q03093-439	WASHER
12		PGZ00438	XLR CONNECTOR, X2
13		SPSP2606N	SCREW, X4
14		PGZ01750	PHONE JACK
△ 15		PGZ00594	4P CONNECTOR
16		SPSP2606N	SCREW, X2
17		SDSP2606Z	SCREW, X3
18		SDSP2606Z	SCREW, X3
20		PRD30030-112	PAD
△ 21		LPSP4008N	SCREW
△ 22		PGZ01268	FERRITE BEADS, X2
23		QCF11HP-223	CAPACITOR

0.022μF,50V



5.2.7 Battery holder assembly M 7



— Battery holder assembly list —

#△ REF No. PART No. PART NAME, DESCRIPTION

BATTERY HOLDER ASSEMBLY <M7>

1	SC10156-001	BATTERY HOLDER BASE
2	PRD30955	PLATE, X3
3	SC45152-001	NUT PLATE
4	SDSP3004N	SCREW
5	SC43570-001	LOCK KNOB
6	SDSP2006M	SCREW
7	NNS2000N	NUT
8	SC43571-001	PLATE
9	PRD44060	SPRING
10	SDSF2005M	SCREW
11	SC45155-001	CUSHION, X2
12	SC20476-001	BATTERY HOLDER COVER(1)
13	PRD30955-02	PLATE, X2
14	PRD44062	SHAFT
15	SSSP2606M	SCREW, X2
16	PRD30955-05	PLATE
17	SPSK2650M	SCREW, X2
18	SC31501-001	SHAFT HOLDER
19	SDSP2605M	SCREW, X4
20	SC20478-001	TERMINAL COVER
21	PRD30955-03	PLATE, X4
22	SC45150-001	TERMINAL PLATE, X4
23	SSSK2040M	SCREW, X4
24	PRD30955-04	PLATE
25	SSSK2040M	SCREW
26	SSSP3005M	SCREW, X3
27	SC20477-001	BATTERY HOLDER COVER(2)
28	SDSP3005M	SCREW
29	SC31319-011	NP-1 GUIDE
30	SC44869-006	CUSHION
31	PRD44066	SHAFT
32	PGJ05027	BATTERY CONNECTOR JIG

SECTION 6 ELECTRICAL PARTS LIST

SAFETY PRECAUTION

Parts identified by the \triangle symbol are critical for safety. Replace only with specified part numbers.

<01>

\triangle REF No. PART No. PART NAME, DESCRIPTION

VIDEO BOARD ASSEMBLY <01>

PWBA PRK10147A-01 VIDEO BOARD ASSY

IC1	TC4094BF	IC
IC2	TA7347P	IC
IC3	TC4S81F	IC
IC4	AN608P	IC
IC5	AN608P	IC
IC6	NJM2285M	IC
IC7	TC4S81F	IC
IC8	TC4S81F	IC
IC9	CXL1506M	IC
IC10	NJM2285M	IC

IC11	8VT15	IC
IC12	JCL0007	IC
IC13	NJM2285M	IC
IC15	TA7347P	IC
IC16	VC2076MP-XE	IC
IC17	TC4S71F	IC
IC18	TC4S81F	IC
IC20	M52074FP	IC

IC22	M5278L05M	IC
IC23	BA7233	IC
IC24	AN6308S	IC
IC25	AN6308S	IC
IC26	M52062AFP	IC
IC30	AN3398	IC

Q1	2SB709A(QR)	TRANSISTOR
Q2	DTC144EU	TRANSISTOR
Q3	2SA1576(QRS)	TRANSISTOR
Q4	2SC4081(QRS)	TRANSISTOR
Q5	2SA1576(QRS)	TRANSISTOR
Q6	2SA1576(QRS)	TRANSISTOR
Q7	2SC4081(QRS)	TRANSISTOR
Q8	2SC4081(QRS)	TRANSISTOR
Q9	2SC4081(QRS)	TRANSISTOR
Q10	2SD601A(QR)	TRANSISTOR

Q11	2SD601A(QR)	TRANSISTOR
Q12	2SC4081(QRS)	TRANSISTOR
Q13	2SC4081(QRS)	TRANSISTOR
Q14	2SC4081(QRS)	TRANSISTOR
Q15	2SD601A(QR)	TRANSISTOR
Q16	2SD601A(QR)	TRANSISTOR
Q17	DTC144EU	TRANSISTOR
Q18	2SB643R,S	TRANSISTOR
Q19	DTC144EU	TRANSISTOR
Q20	2SB643R,S	TRANSISTOR

Q21	DTC144EU	TRANSISTOR
Q22	2SB643R,S	TRANSISTOR
Q23	2SA1576(QRS)	TRANSISTOR
Q24	DTC144EU	TRANSISTOR
Q25	DTC144EU	TRANSISTOR

\triangle REF No. PART No. PART NAME, DESCRIPTION

Q26	2SB643R,S	TRANSISTOR
Q27	DTC144EU	TRANSISTOR
Q28	DTC144EU	TRANSISTOR
Q29	2SA1576(QRS)	TRANSISTOR
Q30	2SA1576(QRS)	TRANSISTOR

Q31	2SA1576(QRS)	TRANSISTOR
Q32	2SA1576(QRS)	TRANSISTOR
Q33	2SA1576(QRS)	TRANSISTOR
Q34	2SC4081(QRS)	TRANSISTOR
Q35	2SA1576(QRS)	TRANSISTOR
Q36	2SA1576(QRS)	TRANSISTOR
Q37	2SC4081(QRS)	TRANSISTOR
Q38	2SC4081(QRS)	TRANSISTOR
Q39	2SC4081(QRS)	TRANSISTOR
Q40	2SC4081(QRS)	TRANSISTOR

Q41	2SA1576(QRS)	TRANSISTOR
Q42	2SA1576(QRS)	TRANSISTOR
Q43	2SA1576(QRS)	TRANSISTOR
Q44	2SC4081(QRS)	TRANSISTOR
Q45	2SK621	FE TRANSISTOR
Q46	2SK621	FE TRANSISTOR
Q47	2SK621	FE TRANSISTOR
Q48	2SC4081(QRS)	TRANSISTOR
Q49	2SC4081(QRS)	TRANSISTOR
Q50	2SC4081(QRS)	TRANSISTOR

Q51	2SA1576(QRS)	TRANSISTOR
Q52	2SA1576(QRS)	TRANSISTOR
Q53	2SD601A(QR)	TRANSISTOR
Q54	2SC4081(QRS)	TRANSISTOR
Q55	2SA1576(QRS)	TRANSISTOR
Q56	2SC4081(QRS)	TRANSISTOR
Q57	2SA1576(QRS)	TRANSISTOR
Q58	2SA1576(QRS)	TRANSISTOR
Q59	2SC4081(QRS)	TRANSISTOR
Q60	2SC4081(QRS)	TRANSISTOR

Q61	2SA1576(QRS)	TRANSISTOR
Q62	2SA1576(QRS)	TRANSISTOR
Q63	2SC4081(QRS)	TRANSISTOR
Q64	2SC4081(QRS)	TRANSISTOR
Q65	2SC4081(QRS)	TRANSISTOR
Q66	2SC4081(QRS)	TRANSISTOR
Q67	2SC4081(QRS)	TRANSISTOR
Q68	2SA1576(QRS)	TRANSISTOR
Q69	2SA1576(QRS)	TRANSISTOR

Q72	2SC4081(QRS)	TRANSISTOR
Q73	2SC4081(QRS)	TRANSISTOR
Q74	2SA1576(QRS)	TRANSISTOR
Q75	DTC144EU	TRANSISTOR
Q76	DTA144EU	TRANSISTOR
Q77	DTC144EU	TRANSISTOR
Q78	DTA144EU	TRANSISTOR
Q79	2SC4081(QRS)	TRANSISTOR
Q80	2SA1576(QRS)	TRANSISTOR

Q81	2SC4081(QRS)	TRANSISTOR
Q82	2SC4081(QRS)	TRANSISTOR

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#△ REF No.	PART No.	PART NAME, DESCRIPTION
Q83	2SK621	FE TRANSISTOR
Q84	2SK621	FE TRANSISTOR
Q85	2SK621	FE TRANSISTOR
Q86	2SC4081(QRS)	TRANSISTOR
Q87	2SC4081(QRS)	TRANSISTOR
Q88	2SC4081(QRS)	TRANSISTOR
Q89	2SC4081(QRS)	TRANSISTOR
Q90	2SA1576(QRS)	TRANSISTOR
Q91	2SA1576(QRS)	TRANSISTOR
Q92	2SC4081(QRS)	TRANSISTOR
Q93	2SC4081(QRS)	TRANSISTOR
Q94	2SA1576(QRS)	TRANSISTOR
Q95	2SC4081(QRS)	TRANSISTOR
Q96	2SC4081(QRS)	TRANSISTOR
Q97	2SC4081(QRS)	TRANSISTOR
Q98	2SA1576(QRS)	TRANSISTOR
Q99	2SC4081(QRS)	TRANSISTOR
Q100	2SC4081(QRS)	TRANSISTOR
Q101	2SA1576(QRS)	TRANSISTOR
Q102	2SA1576(QRS)	TRANSISTOR
Q103	2SC4081(QRS)	TRANSISTOR
Q104	2SA1576(QRS)	TRANSISTOR
Q105	2SA1576(QRS)	TRANSISTOR
Q106	2SC4081(QRS)	TRANSISTOR
Q107	DTC144EU	TRANSISTOR
Q108	2SC4081(QRS)	TRANSISTOR
Q109	DTC144EU	TRANSISTOR
Q110	DTC144EU	TRANSISTOR
Q111	DTC144EU	TRANSISTOR
Q112	DTA144EU	TRANSISTOR
Q113	DTA144EU	TRANSISTOR
Q114	DTC144EU	TRANSISTOR
Q115	2SC4081(QRS)	TRANSISTOR
Q116	2SC4081(QRS)	TRANSISTOR
Q117	DTC144EU	TRANSISTOR
Q118	DTC144EU	TRANSISTOR
Q119	2SA1576(QRS)	TRANSISTOR
Q120	DTC144EU	TRANSISTOR
Q121	2SC4081(QRS)	TRANSISTOR
Q122	DTC144EU	TRANSISTOR
Q123	DTC144EU	TRANSISTOR
Q124	DTC144EU	TRANSISTOR
Q125	DTC144EU	TRANSISTOR
Q126	DTC144TU	TRANSISTOR
Q127	DTC144EU	TRANSISTOR
Q128	DTC144EU	TRANSISTOR
Q129	DTC144EU	TRANSISTOR
Q130	DTA144EU	TRANSISTOR
Q131	DTC144EU	TRANSISTOR
Q132	DTC144EU	TRANSISTOR
Q133	DTC144EU	TRANSISTOR
Q134	2SC4081(QRS)	TRANSISTOR
Q135	2SA1576(QRS)	TRANSISTOR
Q136	2SC4081(QRS)	TRANSISTOR
Q137	DTA144EU	TRANSISTOR
Q138	2SC4081(QRS)	TRANSISTOR
Q139	2SA1576(QRS)	TRANSISTOR

#△ REF No.	PART No.	PART NAME, DESCRIPTION
Q140	2SA1576(QRS)	TRANSISTOR
Q141	2SC4081(QRS)	TRANSISTOR
Q142	2SC4081(QRS)	TRANSISTOR
Q143	2SC4081(QRS)	TRANSISTOR
Q144	DTC144EU	TRANSISTOR
Q145	2SA1576(QRS)	TRANSISTOR
Q146	2SA1576(QRS)	TRANSISTOR
Q147	2SC4081(QRS)	TRANSISTOR
Q148	2SA1576(QRS)	TRANSISTOR
Q149	2SC4081(QRS)	TRANSISTOR
Q151	2SC4081(QRS)	TRANSISTOR
Q152	DTC144EU	TRANSISTOR
Q153	DTC144EU	TRANSISTOR
Q154	DTC144EU	TRANSISTOR
Q155	2SA1576(QRS)	TRANSISTOR
Q156	2SC4081(QRS)	TRANSISTOR
Q157	2SC4081(QRS)	TRANSISTOR
Q158	DTC144EU	TRANSISTOR
Q159	2SC4081(QRS)	TRANSISTOR
Q160	2SC4081(QRS)	TRANSISTOR
Q161	2SC4081(QRS)	TRANSISTOR
Q200	2SA1576(QRS)	TRANSISTOR
Q201	2SC4081(QRS)	TRANSISTOR
Q202	2SC4081(QRS)	TRANSISTOR
Q203	2SC4081(QRS)	TRANSISTOR
Q206	DTC144EU	TRANSISTOR
Q207	DTC144EU	TRANSISTOR
Q208	2SC4081(QRS)	TRANSISTOR
Q209	2SA1576(QRS)	TRANSISTOR
Q210	2SC4081(QRS)	TRANSISTOR
Q211	2SC4081(QRS)	TRANSISTOR
Q212	2SC4081(QRS)	TRANSISTOR
Q213	2SC4081(QRS)	TRANSISTOR
Q214	DTC144EU	TRANSISTOR
Q215	2SA1576(QRS)	TRANSISTOR
Q216	2SC4081(QRS)	TRANSISTOR
Q217	2SK621	FE TRANSISTOR
Q218	2SK621	FE TRANSISTOR
Q219	2SK621	FE TRANSISTOR
Q220	2SC4081(QRS)	TRANSISTOR
Q221	2SC4081(QRS)	TRANSISTOR
D1	1SS133	DIODE
D2	1SS133	DIODE
D3	HZM6CTR	ZENER DIODE
D4	1SS133	DIODE
D5	1SS133	DIODE
D6	HZM6CTR	ZENER DIODE
D7	1SS133	DIODE
D8	1SS133	DIODE
D9	DAN202U	DIODE
D10	1SS133	DIODE
D11	1SS133	DIODE

#△ REF No.	PART No.	PART NAME, DESCRIPTION		#△ REF No.	PART No.	PART NAME, DESCRIPTION	
D12	1SS133	DIODE		R31	NRSA63J-912N	RESISTOR	9.1KΩ,1/16W
D13	1SS133	DIODE		R32	NRSA63J-822N	RESISTOR	8.2KΩ,1/16W
D14	1SS133	DIODE		R33	NRSA63J-821N	RESISTOR	820Ω,1/16W
D15	1SS133	DIODE		R34	NRSA63J-561N	RESISTOR	560Ω,1/16W
D16	1SS133	DIODE		R35	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W
D17	1SS133	DIODE		R36	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W
D18	1SS133	DIODE		R37	NRSA63J-103N	RESISTOR	10KΩ,1/16W
D19	1SS133	DIODE		R38	NRSA63J-822N	RESISTOR	8.2KΩ,1/16W
D20	1SS99	DIODE		R39	NRSA63J-182N	RESISTOR	1.8KΩ,1/16W
				R40	NRSA63J-182N	RESISTOR	1.8KΩ,1/16W
D21	1SS99	DIODE					
D22	DAN202U	DIODE		R41	NRSA63J-392N	RESISTOR	3.9KΩ,1/16W
D23	MA157	DIODE		R42	NRSA63J-680N	RESISTOR	68Ω,1/16W
D24	DAN202U	DIODE		R43	NRSA63J-680N	RESISTOR	68Ω,1/16W
D25	DAN202U	DIODE		R44	NRSA63J-562N	RESISTOR	5.6KΩ,1/16W
D26	DAN202U	DIODE		R45	QRD167J-750	RESISTOR	75Ω,1/6W
D27	DAN202U	DIODE		R46	NRSA63J-223N	RESISTOR	22KΩ,1/16W
D28	DAN202U	DIODE		R47	NRSA63J-681N	RESISTOR	680Ω,1/16W
D29	DAN202U	DIODE		R48	NRSA63J-223N	RESISTOR	22KΩ,1/16W
D30	DAN202U	DIODE		R49	NRSA63J-681N	RESISTOR	680Ω,1/16W
				R50	NRSA63J-223N	RESISTOR	22KΩ,1/16W
D31	DAN202U	DIODE					
D32	MA157	DIODE		R51	NRSA63J-681N	RESISTOR	680Ω,1/16W
D40	DAN202U	DIODE		R52	NRSA63J-223N	RESISTOR	22KΩ,1/16W
				R53	NRSA63J-681N	RESISTOR	680Ω,1/16W
D41	DAN202U	DIODE		R54	NRSA63J-103N	RESISTOR	10KΩ,1/16W
D42	1SS99	DIODE		R55	NRSA63J-223N	RESISTOR	22KΩ,1/16W
D43	1SS99	DIODE		R56	NRSA63J-681N	RESISTOR	680Ω,1/16W
				R57	NRSA63J-103N	RESISTOR	10KΩ,1/16W
				R58	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R1	NRSA63J-0R0N	RESISTOR	0Ω,1/16W	R59	NRSA63J-104N	RESISTOR	100KΩ,1/16W
R2	NRSA63J-272N	RESISTOR	2.7KΩ,1/16W	R60	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W
R3	NRSA63J-393N	RESISTOR	39KΩ,1/16W				
R4	NRSA63J-181N	RESISTOR	180Ω,1/16W	R61	NVP1415-102N	V RESISTOR, EE Y LEVEL	1KΩ,1/4W
R5	NRSA63J-102N	RESISTOR	1KΩ,1/16W	R62	NRSA63J-391N	RESISTOR	390Ω,1/16W
R6	NRSA63J-122N	RESISTOR	1.2KΩ,1/16W	R63	NRSA63J-332N	RESISTOR	3.3KΩ,1/16W
R7	NRSA63J-102N	RESISTOR	1KΩ,1/16W	R64	NRSA63J-681N	RESISTOR	680Ω,1/16W
R8	NRSA63J-102N	RESISTOR	1KΩ,1/16W	R65	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R9	NRSA63J-223N	RESISTOR	22KΩ,1/16W	R66	NVP1415-102N	V RESISTOR, EE VIDEO Y LEV	1KΩ,1/4W
R10	NRSA63J-223N	RESISTOR	22KΩ,1/16W	R67	NRSA63J-271N	RESISTOR	270Ω,1/16W
				R68	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W
R11	NRSA63J-152N	RESISTOR	1.5KΩ,1/16W	R69	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R12	NRSA63J-272N	RESISTOR	2.7KΩ,1/16W	R70	NRSA63J-332N	RESISTOR	3.3KΩ,1/16W
R13	NRSA63J-182N	RESISTOR	1.8KΩ,1/16W				
R14	NRSA63J-181N	RESISTOR	180Ω,1/16W	R71	NRSA63J-472N	RESISTOR	4.7KΩ,1/16W
R15	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W	R72	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W
R16	NRSA63J-912N	RESISTOR	9.1KΩ,1/16W	R73	NRSA63J-181N	RESISTOR	180Ω,1/16W
R17	NRSA63J-822N	RESISTOR	8.2KΩ,1/16W	R74	NRSA63J-332N	RESISTOR	3.3KΩ,1/16W
R18	NRSA63J-821N	RESISTOR	820Ω,1/16W	R75	NRSA63J-681N	RESISTOR	680Ω,1/16W
R19	NRSA63J-561N	RESISTOR	560Ω,1/16W	R76	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R20	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W	R77	NRSA63J-103N	RESISTOR	10KΩ,1/16W
				R78	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R21	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W	R79	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W
R22	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R80	NRSA63J-152N	RESISTOR	1.5KΩ,1/16W
R23	NRSA63J-822N	RESISTOR	8.2KΩ,1/16W				
R24	NRSA63J-182N	RESISTOR	1.8KΩ,1/16W	R81	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R25	NRSA63J-182N	RESISTOR	1.8KΩ,1/16W	R82	NRSA63J-333N	RESISTOR	33KΩ,1/16W
R26	NRSA63J-392N	RESISTOR	3.9KΩ,1/16W	R83	NRSA63J-152N	RESISTOR	1.5KΩ,1/16W
R27	NRSA63J-680N	RESISTOR	68Ω,1/16W	R84	NRSA63J-182N	RESISTOR	1.8KΩ,1/16W
R28	NRSA63J-680N	RESISTOR	68Ω,1/16W	R85	NRSA63J-821N	RESISTOR	820Ω,1/16W
R29	NRSA63J-562N	RESISTOR	5.6KΩ,1/16W	R86	NRSA63J-152N	RESISTOR	1.5KΩ,1/16W
R30	QRD167J-750	RESISTOR	75Ω,1/6W	R87	NRSA63J-101N	RESISTOR	100Ω,1/16W

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#△ REF No.	PART No.	PART NAME, DESCRIPTION		#△ REF No.	PART No.	PART NAME, DESCRIPTION	
R88	NRSA63J-102N	RESISTOR	1KΩ,1/16W	R148	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R89	NRSA63J-102N	RESISTOR	1KΩ,1/16W	R149	NRSA63J-681N	RESISTOR	680Ω,1/16W
R90	NRSA63J-153N	RESISTOR	15KΩ,1/16W	R150	NRSA63J-333N	RESISTOR	33KΩ,1/16W
R91	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R151	NRSA63J-563N	RESISTOR	56KΩ,1/16W
R92	NRSA63J-471N	RESISTOR	470Ω,1/16W	R152	NRSA63J-0R0N	RESISTOR	0Ω,1/16W
R93	NRSA63J-102N	RESISTOR	1KΩ,1/16W	R153	NRSA63J-181N	RESISTOR	180Ω,1/16W
R94	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W	R154	NRSA63J-472N	RESISTOR	4.7KΩ,1/16W
R95	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R155	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R96	NRSA63J-273N	RESISTOR	27KΩ,1/16W	R156	NRSA63J-563N	RESISTOR	56KΩ,1/16W
R98	NRSA63J-182N	RESISTOR	1.8KΩ,1/16W	R157	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R99	NRSA63J-472N	RESISTOR	4.7KΩ,1/16W	R158	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R100	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R160	NRSA63J-681N	RESISTOR	680Ω,1/16W
R101	NRSA63J-104N	RESISTOR	100KΩ,1/16W	R161	NRSA63J-333N	RESISTOR	33KΩ,1/16W
R102	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R162	NRSA63J-563N	RESISTOR	56KΩ,1/16W
R103	NRSA63J-183N	RESISTOR	18KΩ,1/16W	R163	NRSA63J-0R0N	RESISTOR	0Ω,1/16W
R104	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W	R164	NRSA63J-181N	RESISTOR	180Ω,1/16W
R105	NRSA63J-102N	RESISTOR	1KΩ,1/16W	R165	NRSA63J-121N	RESISTOR	120Ω,1/16W
R106	NRSA63J-102N	RESISTOR	1KΩ,1/16W	R166	NRSA63J-823N	RESISTOR	82KΩ,1/16W
R107	NRSA63J-183N	RESISTOR	18KΩ,1/16W	R167	NRSA63J-101N	RESISTOR	100Ω,1/16W
R108	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R168	NRSA63J-105N	RESISTOR	1MΩ,1/16W
R109	NRSA63J-102N	RESISTOR	1KΩ,1/16W	R169	NRSA63J-272N	RESISTOR	2.7KΩ,1/16W
R110	NRSA63J-102N	RESISTOR	1KΩ,1/16W	R170	NRSA63J-331N	RESISTOR	330Ω,1/16W
R111	NRSA63J-101N	RESISTOR	100Ω,1/16W	R171	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R112	NRSA63J-821N	RESISTOR	820Ω,1/16W	R172	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R113	NRSA63J-152N	RESISTOR	1.5KΩ,1/16W	R173	NVP1415-202N	V RESISTOR, UNCORR LEVEL	2KΩ,1/4W
R114	NRSA63J-332N	RESISTOR	3.3KΩ,1/16W	R174	NRSA63J-681N	RESISTOR	680Ω,1/16W
R115	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W	R175	NRSA63J-122N	RESISTOR	1.2KΩ,1/16W
R116	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W	R176	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R117	NRSA63J-102N	RESISTOR	1KΩ,1/16W	R177	NRSA63J-563N	RESISTOR	56KΩ,1/16W
R119	NRSA63J-272N	RESISTOR	2.7KΩ,1/16W	R178	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R120	NRSA63J-0R0N	RESISTOR	0Ω,1/16W	R179	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R121	NRSA63J-272N	RESISTOR	2.7KΩ,1/16W	R180	NRSA63J-331N	RESISTOR	330Ω,1/16W
R122	NRSA63J-272N	RESISTOR	2.7KΩ,1/16W	R181	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R123	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W	R182	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R124	NRSA63J-101N	RESISTOR	100Ω,1/16W	R183	NRSA63J-183N	RESISTOR	18KΩ,1/16W
R125	NRSA63J-102N	RESISTOR	1KΩ,1/16W	R184	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R126	NRSA63J-333N	RESISTOR	33KΩ,1/16W	R185	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R127	NRSA63J-153N	RESISTOR	15KΩ,1/16W	R186	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R128	NRSA63J-152N	RESISTOR	1.5KΩ,1/16W	R187	NRSA63J-123N	RESISTOR	12KΩ,1/16W
R129	NRSA63J-182N	RESISTOR	1.8KΩ,1/16W	R188	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R130	NRSA63J-102N	RESISTOR	1KΩ,1/16W	R189	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R131	NRSA63J-101N	RESISTOR	100Ω,1/16W	R190	NRSA63J-273N	RESISTOR	27KΩ,1/16W
R132	NRSA63J-102N	RESISTOR	1KΩ,1/16W	R191	NRSA63J-153N	RESISTOR	15KΩ,1/16W
R133	NRSA63J-182N	RESISTOR	1.8KΩ,1/16W	R192	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R134	NVP1415-102N	V RESISTOR, EE VIDEO C LEV	1KΩ,1/4W	R193	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R135	NVP1415-102N	V RESISTOR, EE C LEVEL	1KΩ,1/4W	R194	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W
R136	NRSA63J-181N	RESISTOR	180Ω,1/16W	R195	NRSA63J-561N	RESISTOR	560Ω,1/16W
R137	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R196	NVP1415-501N	V RESISTOR, COMB LEVEL	500Ω,1/4W
R138	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R197	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R139	NRSA63J-561N	RESISTOR	560Ω,1/16W	R198	NRSA63J-273N	RESISTOR	27KΩ,1/16W
R140	QRD167J-680	RESISTOR	68Ω,1/6W	R199	NRSA63J-153N	RESISTOR	15KΩ,1/16W
R141	NRSA63J-0R0N	RESISTOR	0Ω,1/16W	R200	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R143	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W	R201	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R144	NRSA63J-223N	RESISTOR	22KΩ,1/16W	R202	NRSA63J-122N	RESISTOR	1.2KΩ,1/16W
R145	NRSA63J-563N	RESISTOR	56KΩ,1/16W	R203	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R146	NRSA63J-102N	RESISTOR	1KΩ,1/16W	R204	NRSA63J-272N	RESISTOR	2.7KΩ,1/16W

#△ REF No.	PART No.	PART NAME, DESCRIPTION		#△ REF No.	PART No.	PART NAME, DESCRIPTION	
R209	NRSA63J-103N	RESISTOR	10KΩ, 1/16W	R268	NRSA63J-561N	RESISTOR	560Ω, 1/16W
R210	NRSA63J-393N	RESISTOR	39KΩ, 1/16W	R269	NRSA63J-102N	RESISTOR	1KΩ, 1/16W
				R270	NRSA63J-392N	RESISTOR	3.9KΩ, 1/16W
R211	NRSA63J-332N	RESISTOR	3.3KΩ, 1/16W				
R212	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	R271	NRSA63J-391N	RESISTOR	390Ω, 1/16W
R213	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	R272	NRSA63J-152N	RESISTOR	1.5KΩ, 1/16W
R214	NRSA63J-821N	RESISTOR	820Ω, 1/16W	R273	NRSA63J-152N	RESISTOR	1.5KΩ, 1/16W
R215	NRSA63J-152N	RESISTOR	1.5KΩ, 1/16W	R274	NRSA63J-102N	RESISTOR	1KΩ, 1/16W
R216	NRSA63J-152N	RESISTOR	1.5KΩ, 1/16W	R275	NRSA63J-102N	RESISTOR	1KΩ, 1/16W
R217	NRSA63J-103N	RESISTOR	10KΩ, 1/16W	R276	NRSA63J-223N	RESISTOR	22KΩ, 1/16W
R218	NRSA63J-123N	RESISTOR	12KΩ, 1/16W	R277	NRSA63J-473N	RESISTOR	47KΩ, 1/16W
R219	NRSA63J-103N	RESISTOR	10KΩ, 1/16W	R278	NRSA63J-681N	RESISTOR	680Ω, 1/16W
R220	NRSA63J-103N	RESISTOR	10KΩ, 1/16W	R279	NRSA63J-821N	RESISTOR	820Ω, 1/16W
				R280	NRSA63J-181N	RESISTOR	180Ω, 1/16W
R221	NRSA63J-103N	RESISTOR	10KΩ, 1/16W				
R222	NRSA63J-103N	RESISTOR	10KΩ, 1/16W	R281	NRSA63J-471N	RESISTOR	470Ω, 1/16W
R223	NRSA63J-333N	RESISTOR	33KΩ, 1/16W	R282	NRSA63J-332N	RESISTOR	3.3KΩ, 1/16W
R224	NRSA63J-153N	RESISTOR	15KΩ, 1/16W	R283	NRSA63J-332N	RESISTOR	3.3KΩ, 1/16W
R225	NRSA63J-222N	RESISTOR	2.2KΩ, 1/16W	R284	NRSA63J-181N	RESISTOR	180Ω, 1/16W
R226	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	R285	NRSA63J-103N	RESISTOR	10KΩ, 1/16W
R227	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	R286	NRSA63J-102N	RESISTOR	1KΩ, 1/16W
R228	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	R287	NRSA63J-271N	RESISTOR	270Ω, 1/16W
R229	NRSA63J-101N	RESISTOR	100Ω, 1/16W	R288	NRSA63J-121N	RESISTOR	120Ω, 1/16W
R230	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	R290	NRSA63J-0R0N	RESISTOR	0Ω, 1/16W
R231	NRSA63J-182N	RESISTOR	1.8KΩ, 1/16W	R291	NRSA63J-391N	RESISTOR	390Ω, 1/16W
R232	NRSA63J-103N	RESISTOR	10KΩ, 1/16W	R292	NRSA63J-222N	RESISTOR	2.2KΩ, 1/16W
R233	NRSA63J-103N	RESISTOR	10KΩ, 1/16W	R293	NVP1415-102N	V RESISTOR, SUB EMPHA IN LEV	1KΩ, 1/4W
R234	NRSA63J-333N	RESISTOR	33KΩ, 1/16W	R294	NRSA63J-182N	RESISTOR	1.8KΩ, 1/16W
R235	NRSA63J-333N	RESISTOR	33KΩ, 1/16W	R295	NRSA63J-102N	RESISTOR	1KΩ, 1/16W
R236	NRSA63J-471N	RESISTOR	470Ω, 1/16W	R296	NVP1415-502N	V RESISTOR, SUB EMPHA OUT LEV	5KΩ, 1/4W
R237	NRSA63J-223N	RESISTOR	22KΩ, 1/16W	R297	NRVA63D-223N	RESISTOR	22KΩ, 1/16W
R238	NRSA63J-223N	RESISTOR	22KΩ, 1/16W	R299	NRVA63D-332N	RESISTOR	3.3KΩ, 1/16W
R239	NRSA63J-223N	RESISTOR	22KΩ, 1/16W				
R240	NRSA63J-223N	RESISTOR	22KΩ, 1/16W	R301	NRVA63D-332N	RESISTOR	3.3KΩ, 1/16W
				R302	NRVA63D-152N	RESISTOR	1.5KΩ, 1/16W
R241	NRSA63J-331N	RESISTOR	330Ω, 1/16W	R303	NRVA63D-471N	RESISTOR	470Ω, 1/16W
R242	NRSA63J-331N	RESISTOR	330Ω, 1/16W	R304	NRVA63D-102N	RESISTOR	1KΩ, 1/16W
R243	NRSA63J-682N	RESISTOR	6.8KΩ, 1/16W	R308	NRVA63D-102N	RESISTOR	1KΩ, 1/16W
R244	NRSA63J-223N	RESISTOR	22KΩ, 1/16W	R309	NRSA63J-821N	RESISTOR	820Ω, 1/16W
R245	NRSA63J-470N	RESISTOR	47Ω, 1/16W	R310	NRSA63J-152N	RESISTOR	1.5KΩ, 1/16W
R246	NRSA63J-272N	RESISTOR	2.7KΩ, 1/16W				
R247	NRSA63J-272N	RESISTOR	2.7KΩ, 1/16W	R311	NRSA63J-471N	RESISTOR	470Ω, 1/16W
R248	NRSA63J-472N	RESISTOR	4.7KΩ, 1/16W	R312	NRSA63J-332N	RESISTOR	3.3KΩ, 1/16W
R249	NRSA63J-472N	RESISTOR	4.7KΩ, 1/16W	R313	NRSA63J-332N	RESISTOR	3.3KΩ, 1/16W
R250	NRSA63J-272N	RESISTOR	2.7KΩ, 1/16W	R314	NRSA63J-473N	RESISTOR	47KΩ, 1/16W
				R315	NRSA63J-153N	RESISTOR	15KΩ, 1/16W
R251	NRSA63J-272N	RESISTOR	2.7KΩ, 1/16W	R316	NRSA63J-222N	RESISTOR	2.2KΩ, 1/16W
R253	NRSA63J-103N	RESISTOR	10KΩ, 1/16W	R317	NRSA63J-681N	RESISTOR	680Ω, 1/16W
R254	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	R318	NRSA63J-181N	RESISTOR	180Ω, 1/16W
R255	NRSA63J-103N	RESISTOR	10KΩ, 1/16W	R319	NRSA63J-242N	RESISTOR	2.4KΩ, 1/16W
R256	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	R320	NRSA63J-181N	RESISTOR	180Ω, 1/16W
R257	NRSA63J-393N	RESISTOR	39KΩ, 1/16W				
R258	NRSA63J-103N	RESISTOR	10KΩ, 1/16W	R321	NRSA63J-102N	RESISTOR	1KΩ, 1/16W
R259	NRSA63J-222N	RESISTOR	2.2KΩ, 1/16W	R324	NRSA63J-102N	RESISTOR	1KΩ, 1/16W
R260	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	R325	NRSA63J-102N	RESISTOR	1KΩ, 1/16W
				R326	NRSA63J-471N	RESISTOR	470Ω, 1/16W
R261	NRSA63J-332N	RESISTOR	3.3KΩ, 1/16W	R327	NRSA63J-332N	RESISTOR	3.3KΩ, 1/16W
R262	NRSA63J-101N	RESISTOR	100Ω, 1/16W	R328	NRSA63J-102N	RESISTOR	1KΩ, 1/16W
R263	NRSA63J-561N	RESISTOR	560Ω, 1/16W	R329	NRSA63J-0R0N	RESISTOR	0Ω, 1/16W
R265	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	R330	NRSA63J-102N	RESISTOR	1KΩ, 1/16W
R267	NRSA63J-561N	RESISTOR	560Ω, 1/16W				

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#△ REF No.	PART No.	PART NAME, DESCRIPTION		#△ REF No.	PART No.	PART NAME, DESCRIPTION
R331	NRSA63J-0R0N	RESISTOR	0Ω, 1/16W	R389	NVP1415-203N	V RESISTOR, VHS PB Y LEV 20KΩ, 1/4W
R332	NRSA63J-181N	RESISTOR	180Ω, 1/16W	R390	NVP1415-103N	V RESISTOR, S-VHS PB Y LEV 10KΩ, 1/4W
R333	NRSA63J-222N	RESISTOR	2.2KΩ, 1/16W			
R335	NRSA63J-103N	RESISTOR	10KΩ, 1/16W	R392	NRSA63J-103N	RESISTOR 10KΩ, 1/16W
R336	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	R393	NRSA63J-392N	RESISTOR 3.9KΩ, 1/16W
R337	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	R394	NRSA63J-562N	RESISTOR 5.6KΩ, 1/16W
R338	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	R395	NRSA63J-561N	RESISTOR 560Ω, 1/16W
R339	NRSA63J-473N	RESISTOR	47KΩ, 1/16W	R396	NRSA63J-561N	RESISTOR 560Ω, 1/16W
R340	NRSA63J-562N	RESISTOR	5.6KΩ, 1/16W	R399	NRSA63J-332N	RESISTOR 3.3KΩ, 1/16W
				R400	NVP1415-202N	V RESISTOR, VIDEO PB C LEV 2KΩ, 1/4W
R341	NRSA63J-122N	RESISTOR	1.2KΩ, 1/16W			
R342	NRSA63J-272N	RESISTOR	2.7KΩ, 1/16W	R401	NRSA63J-821N	RESISTOR 820Ω, 1/16W
R343	NRSA63J-122N	RESISTOR	1.2KΩ, 1/16W	R402	NRSA63J-181N	RESISTOR 180Ω, 1/16W
R344	NRSA63J-393N	RESISTOR	39KΩ, 1/16W	R403	NRSA63J-223N	RESISTOR 22KΩ, 1/16W
R345	NRSA63J-680N	RESISTOR	68Ω, 1/16W	R404	NRSA63J-223N	RESISTOR 22KΩ, 1/16W
R346	NRSA63J-560N	RESISTOR	56Ω, 1/16W	R405	NRSA63J-392N	RESISTOR 3.9KΩ, 1/16W
R347	NVP1415-503N	V RESISTOR, VHS CARRI	50KΩ, 1/4W	R406	NRSA63J-222N	RESISTOR 2.2KΩ, 1/16W
R348	NVP1415-203N	V RESISTOR, VHS DEVI	20KΩ, 1/4W	R407	NRSA63J-181N	RESISTOR 180Ω, 1/16W
R349	NVP1415-503N	V RESISTOR, S-VHS CARRI	50KΩ, 1/4W	R408	NRSA63J-101N	RESISTOR 100Ω, 1/16W
R350	NVP1415-203N	V RESISTOR, S-VHS DEVI	20KΩ, 1/4W	R409	NVP1415-202N	V RESISTOR, Y/C PB C LEV 2KΩ, 1/4W
				R410	NRSA63J-102N	RESISTOR 1KΩ, 1/16W
R351	NRSA63J-272N	RESISTOR	2.7KΩ, 1/16W			
R352	NRVA63D-681N	RESISTOR	680Ω, 1/16W	R411	NRSA63J-222N	RESISTOR 2.2KΩ, 1/16W
R353	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	R412	NRSA63J-102N	RESISTOR 1KΩ, 1/16W
R354	NRSA63J-125N	RESISTOR	1.2MΩ, 1/16W	R413	NRSA63J-223N	RESISTOR 22KΩ, 1/16W
R355	NRSA63J-561N	RESISTOR	560Ω, 1/16W	R414	NRSA63J-103N	RESISTOR 10KΩ, 1/16W
R356	NRSA63J-103N	RESISTOR	10KΩ, 1/16W	R415	NRSA63J-102N	RESISTOR 1KΩ, 1/16W
R357	NRSA63J-103N	RESISTOR	10KΩ, 1/16W	R416	NVP1415-103N	V RESISTOR, C LEVEL & PHASE 10KΩ, 1/4W
R358	NVP1415-103N	V RESISTOR, S-VHS W.CLIP	10KΩ, 1/4W	R417	NRSA63J-473N	RESISTOR 47KΩ, 1/16W
R359	NVP1415-103N	V RESISTOR, VHS W.CLIP	10KΩ, 1/4W	R418	NRSA63J-473N	RESISTOR 47KΩ, 1/16W
R360	NRSA63J-272N	RESISTOR	2.7KΩ, 1/16W	R419	NRSA63J-123N	RESISTOR 12KΩ, 1/16W
				R420	NRSA63J-392N	RESISTOR 3.9KΩ, 1/16W
R361	NVP1415-103N	V RESISTOR, VHS D.CLIP	10KΩ, 1/4W			
R362	NVP1415-103N	V RESISTOR, S-VHS D.CLIP	10KΩ, 1/4W	R421	NRSA63J-391N	RESISTOR 390Ω, 1/16W
R363	NRSA63J-562N	RESISTOR	5.6KΩ, 1/16W	R422	NRSA63J-101N	RESISTOR 100Ω, 1/16W
R364	NRSA63J-471N	RESISTOR	470Ω, 1/16W	R423	NRSA63J-391N	RESISTOR 390Ω, 1/16W
R365	NRSA63J-471N	RESISTOR	470Ω, 1/16W	R424	NVP1415-202N	V RESISTOR, CNR DELAY LEVEL 2KΩ, 1/4W
R366	NRSA63J-181N	RESISTOR	180Ω, 1/16W	R425	NVP1415-501N	V RESISTOR, CNR FEED BACK GAIN 500Ω, 1/4W
R367	NRSA63J-821N	RESISTOR	820Ω, 1/16W	R426	NVP1415-202N	V RESISTOR, CNR INPUT LEVEL 2KΩ, 1/4W
R368	NRSA63J-151N	RESISTOR	150Ω, 1/16W	R427	NRSA63J-223N	RESISTOR 22KΩ, 1/16W
R369	NRSA63J-273N	RESISTOR	27KΩ, 1/16W	R428	NRSA63J-222N	RESISTOR 2.2KΩ, 1/16W
R370	NRSA63J-273N	RESISTOR	27KΩ, 1/16W	R429	NRSA63J-681N	RESISTOR 680Ω, 1/16W
				R430	NRSA63J-102N	RESISTOR 1KΩ, 1/16W
R371	NVP1415-203N	V RESISTOR, AGC LEV	20KΩ, 1/4W			
R372	NRSA63J-123N	RESISTOR	12KΩ, 1/16W	R431	NRSA63J-103N	RESISTOR 10KΩ, 1/16W
R373	NRSA63J-473N	RESISTOR	47KΩ, 1/16W	R432	NRSA63J-561N	RESISTOR 560Ω, 1/16W
R374	NRSA63J-473N	RESISTOR	47KΩ, 1/16W	R433	NRSA63J-102N	RESISTOR 1KΩ, 1/16W
R375	NRSA63J-103N	RESISTOR	10KΩ, 1/16W	R434	NRSA63J-102N	RESISTOR 1KΩ, 1/16W
R376	NRSA63J-682N	RESISTOR	6.8KΩ, 1/16W	R435	NRSA63J-102N	RESISTOR 1KΩ, 1/16W
R377	NRSA63J-822N	RESISTOR	8.2KΩ, 1/16W	R436	NVP1415-202N	V RESISTOR, VHS PB Y/C DELAY 2KΩ, 1/4W
R378	NRSA63J-103N	RESISTOR	10KΩ, 1/16W	R437	NRSA63J-102N	RESISTOR 1KΩ, 1/16W
R379	NRSA63J-822N	RESISTOR	8.2KΩ, 1/16W	R438	NRSA63J-223N	RESISTOR 22KΩ, 1/16W
R380	NRSA63J-223N	RESISTOR	22KΩ, 1/16W	R439	NRSA63J-223N	RESISTOR 22KΩ, 1/16W
				R440	NRSA63J-222N	RESISTOR 2.2KΩ, 1/16W
R381	NRSA63J-562N	RESISTOR	5.6KΩ, 1/16W			
R382	NRSA63J-821N	RESISTOR	820Ω, 1/16W	R441	NRSA63J-102N	RESISTOR 1KΩ, 1/16W
R383	NRSA63J-225N	RESISTOR	2.2MΩ, 1/16W	R442	NRSA63J-102N	RESISTOR 1KΩ, 1/16W
R384	NRSA63J-152N	RESISTOR	1.5KΩ, 1/16W	R443	NVP1415-202N	V RESISTOR, S-VHS PB Y/C DELAY 2KΩ, 1/4W
R385	NRSA63J-103N	RESISTOR	10KΩ, 1/16W	R444	NRSA63J-102N	RESISTOR 1KΩ, 1/16W
R386	NRSA63J-331N	RESISTOR	330Ω, 1/16W	R445	NRSA63J-102N	RESISTOR 1KΩ, 1/16W
R387	NRSA63J-103N	RESISTOR	10KΩ, 1/16W	R446	NRSA63J-223N	RESISTOR 22KΩ, 1/16W
R388	NRSA63J-472N	RESISTOR	4.7KΩ, 1/16W	R447	NRSA63J-223N	RESISTOR 22KΩ, 1/16W

#△ REF No.	PART No.	PART NAME, DESCRIPTION		#△ REF No.	PART No.	PART NAME, DESCRIPTION	
R448	NRSA63J-102N	RESISTOR	1KΩ,1/16W	R507	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R450	NRSA63J-331N	RESISTOR	330Ω,1/16W	R509	NRSA63J-472N	RESISTOR	4.7KΩ,1/16W
R451	NRSA63J-332N	RESISTOR	3.3KΩ,1/16W	R600	NVP1415-503N	V RESISTOR, S-DET ADJ	50KΩ,1/4W
R452	NRSA63J-681N	RESISTOR	680Ω,1/16W	R602	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R453	NRSA63J-272N	RESISTOR	2.7KΩ,1/16W	R603	NRSA63J-272N	RESISTOR	2.7KΩ,1/16W
R454	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R604	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R455	NRSA63J-333N	RESISTOR	33KΩ,1/16W	R605	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R456	NRSA63J-101N	RESISTOR	100Ω,1/16W	R606	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R457	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W	R607	NRSA63J-0R0N	RESISTOR	0Ω,1/16W
R458	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R608	NRSA63J-0R0N	RESISTOR	0Ω,1/16W
R459	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R609	NRSA63J-0R0N	RESISTOR	0Ω,1/16W
R460	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R610	NVP1415-102N	V RESISTOR, 1H DELAY LEV	1KΩ,1/4W
R461	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R611	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R462	NRSA63J-122N	RESISTOR	1.2KΩ,1/16W	R612	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R463	NRSA63J-471N	RESISTOR	470Ω,1/16W	R613	NRSA63J-181N	RESISTOR	180Ω,1/16W
R464	NRSA63J-182N	RESISTOR	1.8KΩ,1/16W	R614	NRSA63J-181N	RESISTOR	180Ω,1/16W
R465	NRSA63J-562N	RESISTOR	5.6KΩ,1/16W	R615	NRSA63J-151N	RESISTOR	150Ω,1/16W
R466	NRSA63J-102N	RESISTOR	1KΩ,1/16W	R616	NRSA63J-0R0N	RESISTOR	0Ω,1/16W
R467	NRSA63J-102N	RESISTOR	1KΩ,1/16W	R617	NRSA63J-0R0N	RESISTOR	0Ω,1/16W
R468	NRSA63J-102N	RESISTOR	1KΩ,1/16W	R618	NRSA63J-0R0N	RESISTOR	0Ω,1/16W
R469	NRSA63J-102N	RESISTOR	1KΩ,1/16W	R619	NRSA63J-0R0N	RESISTOR	0Ω,1/16W
R470	NRSA63J-102N	RESISTOR	1KΩ,1/16W	R621	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R471	NRSA63J-681N	RESISTOR	680Ω,1/16W	R622	NRSA63J-333N	RESISTOR	33KΩ,1/16W
R472	NRSA63J-821N	RESISTOR	820Ω,1/16W	R623	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R473	NRSA63J-181N	RESISTOR	180Ω,1/16W	R624	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R474	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R625	NRSA63J-331N	RESISTOR	330Ω,1/16W
R475	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W	R626	NRSA63J-821N	RESISTOR	820Ω,1/16W
R476	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R627	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R477	NRSA63J-121N	RESISTOR	120Ω,1/16W	R628	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R478	NRSA63J-120N	RESISTOR	12Ω,1/16W	R629	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W
R479	NRSA63J-682N	RESISTOR	6.8KΩ,1/16W	R630	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R481	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R631	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R482	NRSA63J-223N	RESISTOR	22KΩ,1/16W	R632	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R483	NRSA63J-102N	RESISTOR	1KΩ,1/16W	R633	NRSA63J-152N	RESISTOR	1.5KΩ,1/16W
R484	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R634	NRSA63J-333N	RESISTOR	33KΩ,1/16W
R485	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R635	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R486	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R636	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R487	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R637	NRSA63J-391N	RESISTOR	390Ω,1/16W
R488	NRSA63J-562N	RESISTOR	5.6KΩ,1/16W	R638	NRSA63J-821N	RESISTOR	820Ω,1/16W
R489	NRSA63J-182N	RESISTOR	1.8KΩ,1/16W	R639	NRSA63J-122N	RESISTOR	1.2KΩ,1/16W
R490	NRSA63J-563N	RESISTOR	56KΩ,1/16W	R640	NRSA63J-272N	RESISTOR	2.7KΩ,1/16W
R491	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R641	NRSA63J-0R0N	RESISTOR	0Ω,1/16W
R492	NVP1415-204N	V RESISTOR, PILOT BURST LEV	200KΩ,1/4W	R642	NRSA63J-0R0N	RESISTOR	0Ω,1/16W
R493	NRSA63J-332N	RESISTOR	3.3KΩ,1/16W	R643	NRSA63J-0R0N	RESISTOR	0Ω,1/16W
R494	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R644	NRSA63J-0R0N	RESISTOR	0Ω,1/16W
R495	NRSA63J-104N	RESISTOR	100KΩ,1/16W	R649	NRSA63J-684N	RESISTOR	680KΩ,1/16W
R496	NRSA63J-562N	RESISTOR	5.6KΩ,1/16W	R652	NRSA63J-0R0N	RESISTOR	0Ω,1/16W
R497	NRSA63J-822N	RESISTOR	8.2KΩ,1/16W	R653	NRSA63J-820N	RESISTOR	82Ω,1/16W
R498	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W	R654	NRSA63J-562N	RESISTOR	5.6KΩ,1/16W
R499	NRSA63J-182N	RESISTOR	1.8KΩ,1/16W	R655	NRSA63J-562N	RESISTOR	5.6KΩ,1/16W
R500	NRSA63J-102N	RESISTOR	1KΩ,1/16W	R656	NRSA63J-272N	RESISTOR	2.7KΩ,1/16W
R501	NRSA63J-563N	RESISTOR	56KΩ,1/16W	R657	NRSA63J-181N	RESISTOR	180Ω,1/16W
R502	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R661	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R503	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R662	NRSA63J-122N	RESISTOR	1.2KΩ,1/16W
R504	NRSA63J-152N	RESISTOR	1.5KΩ,1/16W				
R505	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W				

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#△ REF No.	PART No.	PART NAME, DESCRIPTION		#△ REF No.	PART No.	PART NAME, DESCRIPTION	
R663	NRSA63J-103N	RESISTOR	10KΩ, 1/16W	C30	NEH11EM-475NZ	E CAPACITOR	4.7μF, 25V
R664	NRSA63J-182N	RESISTOR	1.8KΩ, 1/16W	C31	NEH11CM-106N	E CAPACITOR	10μF, 16V
R665	NRSA63J-563N	RESISTOR	56KΩ, 1/16W	C32	NEH11EM-336NP	E CAPACITOR	33μF, 25V
R666	NRSA63J-103N	RESISTOR	10KΩ, 1/16W	C33	NCB31EK-103A	CAPACITOR	0.01μF, 25V
R667	NRSA63J-153N	RESISTOR	15KΩ, 1/16W	C34	NEH11CM-476NP	E CAPACITOR	47μF, 16V
R668	NRSA63J-103N	RESISTOR	10KΩ, 1/16W	C35	NCT08CH-390A	CAPACITOR	39PF
R669	NRSA63J-222N	RESISTOR	2.2KΩ, 1/16W	C36	NEH11CM-106N	E CAPACITOR	10μF, 16V
R670	NRSA63J-560N	RESISTOR	56Ω, 1/16W	C37	NEN10JM-106NZ	E CAPACITOR	10μF, 6.3V
R671	NRSA63J-222N	RESISTOR	2.2KΩ, 1/16W	C38	NCS31HJ-150A	CAPACITOR	15PF, 50V
R672	NRSA63J-223N	RESISTOR	22KΩ, 1/16W	C39	NEH10JM-106N	E CAPACITOR	10μF, 6.3V
R673	NRSA63J-223N	RESISTOR	22KΩ, 1/16W	C40	NEH11CM-106N	E CAPACITOR	10μF, 16V
R674	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	C41	NCT08CH-680A	CAPACITOR	68PF
R675	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	C42	NCS31HJ-390A	CAPACITOR	39PF, 50V
R676	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	C43	NCS31HJ-121A	CAPACITOR	120PF, 50V
R677	NRSA63J-272N	RESISTOR	2.7KΩ, 1/16W	C44	NCB31EK-103A	CAPACITOR	0.01μF, 25V
R678	NRSA63J-272N	RESISTOR	2.7KΩ, 1/16W	C46	NCB31EK-103A	CAPACITOR	0.01μF, 25V
R679	NRSA63J-272N	RESISTOR	2.7KΩ, 1/16W	C47	NEH11EM-336NP	E CAPACITOR	33μF, 25V
R680	NRSA63J-222N	RESISTOR	2.2KΩ, 1/16W	C48	NCT08CH-560A	CAPACITOR	56PF
R681	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	C49	NCB31EK-103A	CAPACITOR	0.01μF, 25V
R682	NRSA63J-103N	RESISTOR	10KΩ, 1/16W	C50	QFN31HJ-103	M CAPACITOR	0.01μF, 50V
R683	NRSA63J-273N	RESISTOR	27KΩ, 1/16W	C51	NEH11EM-336NP	E CAPACITOR	33μF, 25V
R684	NRSA63J-222N	RESISTOR	2.2KΩ, 1/16W	C52	NCB31EK-103A	CAPACITOR	0.01μF, 25V
R685	NRSA63J-822N	RESISTOR	8.2KΩ, 1/16W	C53	NEH11CM-106N	E CAPACITOR	10μF, 16V
R686	NRSA63J-561N	RESISTOR	560Ω, 1/16W	C55	NEH11CM-106N	E CAPACITOR	10μF, 16V
R687	NRSA63J-122N	RESISTOR	1.2KΩ, 1/16W	C56	NCS31HJ-100A	CAPACITOR	10PF, 50V
R688	NRSA63J-101N	RESISTOR	100Ω, 1/16W	C57	NEH11CM-106N	E CAPACITOR	10μF, 16V
R689	NRSA63J-331N	RESISTOR	330Ω, 1/16W	C59	NEH11CM-106N	E CAPACITOR	10μF, 16V
C1	NCS31HJ-100A	CAPACITOR	10PF, 50V	C60	NCS31HJ-100A	CAPACITOR	10PF, 50V
C2	NCS31HJ-100A	CAPACITOR	10PF, 50V	C61	NEH11EM-336NP	E CAPACITOR	33μF, 25V
C3	NCB31EK-103A	CAPACITOR	0.01μF, 25V	C62	NCB31EK-103A	CAPACITOR	0.01μF, 25V
C4	NEH11EM-336NP	E CAPACITOR	33μF, 25V	C63	NEH11HM-105NZ	E CAPACITOR	1μF, 50V
C5	NEH11CM-476NP	E CAPACITOR	47μF, 16V	C64	NEH11EM-475NZ	E CAPACITOR	4.7μF, 25V
C6	NEH11CM-106N	E CAPACITOR	10μF, 16V	C65	NCB31HK-102A	CAPACITOR	0.001μF, 50V
C7	NEH11CM-106N	E CAPACITOR	10μF, 16V	C66	NEH11HM-224NZ	E CAPACITOR	0.22μF, 50V
C8	NEH11CM-106N	E CAPACITOR	10μF, 16V	C67	NEH11EM-475NZ	E CAPACITOR	4.7μF, 25V
C9	NEN10JM-106NZ	E CAPACITOR	10μF, 6.3V	C68	NCB31HK-102A	CAPACITOR	0.001μF, 50V
C10	NCB31EK-103A	CAPACITOR	0.01μF, 25V	C69	NEN11HM-224NZ	E CAPACITOR	0.22μF, 50V
C11	NEH11CM-476NP	E CAPACITOR	47μF, 16V	C70	NCB31HK-102A	CAPACITOR	0.001μF, 50V
C12	NCB31EK-103A	CAPACITOR	0.01μF, 25V	C71	NCB31HK-102A	CAPACITOR	0.001μF, 50V
C13	NEH11EM-336NP	E CAPACITOR	33μF, 25V	C72	NEH11HM-105NZ	E CAPACITOR	1μF, 50V
C14	NEH10JM-107NP	E CAPACITOR	100μF, 6.3V	C73	NCS31HJ-101A	CAPACITOR	100PF, 50V
C15	NEH11HM-225NZ	E CAPACITOR	2.2μF, 50V	C74	NEN10JM-106NZ	E CAPACITOR	10μF, 6.3V
C16	NEH10JM-476NP	E CAPACITOR	47μF, 6.3V	C75	NEN10JM-106NZ	E CAPACITOR	10μF, 6.3V
C17	NEH10JM-107NP	E CAPACITOR	100μF, 6.3V	C76	NEH11EM-336NP	E CAPACITOR	33μF, 25V
C18	NEH11HM-225NZ	E CAPACITOR	2.2μF, 50V	C77	NCB31EK-103A	CAPACITOR	0.01μF, 25V
C19	NCB31EK-103A	CAPACITOR	0.01μF, 25V	C78	NEH11EM-336NP	E CAPACITOR	33μF, 25V
C20	NCB31EK-103A	CAPACITOR	0.01μF, 25V	C79	NEH11EM-336NP	E CAPACITOR	33μF, 25V
C21	NCB31EK-103A	CAPACITOR	0.01μF, 25V	C80	NCS31HJ-4R0A	CAPACITOR	4PF, 50V
C22	NEH11EM-336NP	E CAPACITOR	33μF, 25V	C81	NCB31EK-103A	CAPACITOR	0.01μF, 25V
C23	NCB31EK-103A	CAPACITOR	0.01μF, 25V	C82	NEH11EM-336NP	E CAPACITOR	33μF, 25V
C24	NEN10JM-106NZ	E CAPACITOR	10μF, 6.3V	C83	NEH11CM-226NP	E CAPACITOR	22μF, 16V
C25	NEH11EM-475NZ	E CAPACITOR	4.7μF, 25V	C84	NEN10JM-226NP	E CAPACITOR	22μF, 6.3V
C26	NEH11CM-476NP	E CAPACITOR	47μF, 16V	C85	NEN10JM-106NZ	E CAPACITOR	10μF, 6.3V
C27	NEH11CM-106N	E CAPACITOR	10μF, 16V	C86	NEH10JM-106N	E CAPACITOR	10μF, 6.3V
C28	NEH11EM-475NZ	E CAPACITOR	4.7μF, 25V	C87	NCB31EK-103A	CAPACITOR	0.01μF, 25V
C29	NCB31EK-103A	CAPACITOR	0.01μF, 25V	C88	NEH11EM-336NP	E CAPACITOR	33μF, 25V

#△ REF No.	PART No.	PART NAME, DESCRIPTION		#△ REF No.	PART No.	PART NAME, DESCRIPTION	
C89	NEH11CM-106N	E CAPACITOR	10μF,16V	C151	NCB31EK-103A	CAPACITOR	0.01μF,25V
C91	NEN11EM-475NZ	NP E CAPACITOR	4.7μF,25V	C152	NCS31HJ-120A	CAPACITOR	12PF,50V
C92	NEN11EM-475NZ	NP E CAPACITOR	4.7μF,25V	C153	NCB31EK-103A	CAPACITOR	0.01μF,25V
C93	NEH11CM-106N	E CAPACITOR	10μF,16V	C154	NEH11HM-224NZ	E CAPACITOR	0.22μF,50V
C94	NEH11CM-106N	E CAPACITOR	10μF,16V	C155	NCB31EK-103A	CAPACITOR	0.01μF,25V
C95	NCT08CH-221A	CAPACITOR	220PF	C156	NCT08CH-271A	CAPACITOR	270PF
C96	NCS31HJ-561A	CAPACITOR	560PF,50V	C157	NCT08CH-101A	CAPACITOR	100PF
C98	NEH11CM-106N	E CAPACITOR	10μF,16V	C158	NCS31HJ-390A	CAPACITOR	39PF,50V
C99	NCB31EK-103A	CAPACITOR	0.01μF,25V	C159	NEH11HM-474NZ	E CAPACITOR	0.47μF,50V
C100	NEN10JM-106NZ	E CAPACITOR	10μF,6.3V	C160	NEN11EM-475NZ	NP E CAPACITOR	4.7μF,25V
C101	NEN10JM-106NZ	E CAPACITOR	10μF,6.3V	C161	NEH11CM-106N	E CAPACITOR	10μF,16V
C102	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V	C162	NEH10JM-226N	E CAPACITOR	22μF,6.3V
C103	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V	C163	NEH11HM-105NZ	E CAPACITOR	1μF,50V
C104	NEH11CM-106N	E CAPACITOR	10μF,16V	C164	NEH11HM-474NZ	E CAPACITOR	0.47μF,50V
C105	NCT08CH-470A	CAPACITOR	47PF	C165	NEH10JM-226N	E CAPACITOR	22μF,6.3V
C107	NCS31HJ-101A	CAPACITOR	100PF,50V	C166	NCB31EK-103A	CAPACITOR	0.01μF,25V
C108	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V	C167	NEH11CM-106N	E CAPACITOR	10μF,16V
C109	NEH11CM-106N	E CAPACITOR	10μF,16V	C168	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V
C110	NEH11CM-106N	E CAPACITOR	10μF,16V	C169	NEH11CM-476NP	E CAPACITOR	47μF,16V
C111	NEH11CM-106N	E CAPACITOR	10μF,16V	C170	NEH10JM-107NP	E CAPACITOR	100μF,6.3V
C112	NEH11CM-106N	E CAPACITOR	10μF,16V	C171	NCB31EK-103A	CAPACITOR	0.01μF,25V
C115	NCB31EK-103A	CAPACITOR	0.01μF,25V	C172	QEF80JM-106	TANTAL CAPACITOR	10μF,6.3V
C116	NEH11CM-106N	E CAPACITOR	10μF,16V	C174	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V
C117	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V	C175	NEH11HM-225NZ	E CAPACITOR	2.2μF,50V
C118	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V	C176	NEH11HM-225NZ	E CAPACITOR	2.2μF,50V
C119	NEH11CM-476NP	E CAPACITOR	47μF,16V	C177	NEH11HM-474NZ	E CAPACITOR	0.47μF,50V
C120	NEH11CM-106N	E CAPACITOR	10μF,16V	C178	NCS31HJ-221A	CAPACITOR	220PF,50V
C121	NCB31EK-103A	CAPACITOR	0.01μF,25V	C179	NCS31HJ-680A	CAPACITOR	68PF,50V
C122	NEH11EM-336NP	E CAPACITOR	33μF,25V	C180	NCB31EK-103A	CAPACITOR	0.01μF,25V
C123	NCT08CH-301A	CAPACITOR	300PF	C181	NCS31HJ-470A	CAPACITOR	47PF,50V
C124	NCT08CH-301A	CAPACITOR	300PF	C182	NCB31EK-103A	CAPACITOR	0.01μF,25V
C125	NCT08CH-221A	CAPACITOR	220PF	C185	NCT08CH-331A	CAPACITOR	330PF
C126	NCT08CH-820A	CAPACITOR	82PF	C186	NCT08CH-121A	CAPACITOR	120PF
C127	NCT08CH-271A	CAPACITOR	270PF	C187	NCT08CH-331A	CAPACITOR	330PF
C128	NCT08CH-470A	CAPACITOR	47PF	C188	NCT08CH-180A	CAPACITOR	18PF
C129	NCT08CH-181A	CAPACITOR	180PF	C189	NCB31EK-103A	CAPACITOR	0.01μF,25V
C130	NCT08CH-271A	CAPACITOR	270PF	C190	NCB31EK-103A	CAPACITOR	0.01μF,25V
C131	NCT08CH-271A	CAPACITOR	270PF	C191	NCB31EK-103A	CAPACITOR	0.01μF,25V
C132	NCB31EK-103A	CAPACITOR	0.01μF,25V	C192	NEH11EM-336NP	E CAPACITOR	33μF,25V
C133	NCT08CH-680A	CAPACITOR	68PF	C193	NEH11CM-106N	E CAPACITOR	10μF,16V
C135	NCS31HJ-151A	CAPACITOR	150PF,50V	C194	NCB31EK-103A	CAPACITOR	0.01μF,25V
C136	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V	C195	QEF81AM-336	TANTAL CAPACITOR	33μF,10V
C137	NEH11EM-336NP	E CAPACITOR	33μF,25V	C196	NCB31EK-103A	CAPACITOR	0.01μF,25V
C138	NCB31EK-103A	CAPACITOR	0.01μF,25V	C197	NCB31EK-103A	CAPACITOR	0.01μF,25V
C139	NCB31EK-103A	CAPACITOR	0.01μF,25V	C198	QAT3001-017	TRIMMER, C LEVEL & PHASE	
C140	NEH11CM-476NP	E CAPACITOR	47μF,16V	C199	NCB31EK-103A	CAPACITOR	0.01μF,25V
C141	NEH11CM-106N	E CAPACITOR	10μF,16V	C200	NCS31HJ-121A	CAPACITOR	120PF,50V
C142	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V	C201	NCB31EK-103A	CAPACITOR	0.01μF,25V
C143	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V	C202	NCB31EK-103A	CAPACITOR	0.01μF,25V
C144	NEH11EM-336NP	E CAPACITOR	33μF,25V	C203	NCB31EK-103A	CAPACITOR	0.01μF,25V
C145	NCB31EK-103A	CAPACITOR	0.01μF,25V	C204	NCB31EK-103A	CAPACITOR	0.01μF,25V
C146	QEF80JM-106	TANTAL CAPACITOR	10μF,6.3V	C205	NCT08CH-101A	CAPACITOR	100PF
C147	NCB31EK-103A	CAPACITOR	0.01μF,25V	C206	NCB31EK-103A	CAPACITOR	0.01μF,25V
C148	NEH10JM-107NP	E CAPACITOR	100μF,6.3V	C207	NCB31EK-103A	CAPACITOR	0.01μF,25V
C149	NCS31HJ-390A	CAPACITOR	39PF,50V	C208	NEH10JM-476NP	E CAPACITOR	47μF,6.3V
C150	NCB31EK-103A	CAPACITOR	0.01μF,25V	C209	NEH11HM-105NZ	E CAPACITOR	1μF,50V
				C210	NCB31EK-103A	CAPACITOR	0.01μF,25V

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#△ REF No.	PART No.	PART NAME, DESCRIPTION		#△ REF No.	PART No.	PART NAME, DESCRIPTION	
C211	NEH10JM-476NP	E CAPACITOR	47μF,6.3V	C271	QEF81VM-104	TANTAL CAPACITOR	0.1μF,35V
C212	NCB31EK-103A	CAPACITOR	0.01μF,25V	C272	NCS31HJ-101A	CAPACITOR	100PF,50V
C213	NEH11EM-336NP	E CAPACITOR	33μF,25V	C273	NCB31EK-103A	CAPACITOR	0.01μF,25V
C214	NCB31EK-103A	CAPACITOR	0.01μF,25V	C274	QFN31HJ-103	M CAPACITOR	0.01μF,50V
C215	NCB31EK-103A	CAPACITOR	0.01μF,25V	C275	NCB31EK-103A	CAPACITOR	0.01μF,25V
C216	NCB31EK-103A	CAPACITOR	0.01μF,25V	C276	NCT08CH-270A	CAPACITOR	27PF
C217	NCB31EK-103A	CAPACITOR	0.01μF,25V	C277	NCT08CH-390A	CAPACITOR	39PF
C218	NCS31HJ-151A	CAPACITOR	150PF,50V	C278	QETA1CM-108	E CAPACITOR	1000μF,16V
C219	NCS31HJ-151A	CAPACITOR	150PF,50V	C279	NCB31EK-103A	CAPACITOR	0.01μF,25V
C220	NCB31HK-103A	CAPACITOR	0.01μF,50V	C280	NCS31HJ-270A	CAPACITOR	27PF,50V
C221	NCS31HJ-221A	CAPACITOR	220PF,50V	C286	NCB31EK-103A	CAPACITOR	0.01μF,25V
C222	NCS31HJ-151A	CAPACITOR	150PF,50V	C300	NCB31EK-103A	CAPACITOR	0.01μF,25V
C223	NCB31HK-103A	CAPACITOR	0.01μF,50V	C301	NEH11EM-336NP	E CAPACITOR	33μF,25V
C225	NCS31HJ-560A	CAPACITOR	56PF,50V	C302	NCB31EK-103A	CAPACITOR	0.01μF,25V
C227	NCB31EK-103A	CAPACITOR	0.01μF,25V	C303	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V
C228	NCB31HK-102A	CAPACITOR	0.001μF,50V	C304	NEH11HM-474NZ	E CAPACITOR	0.47μF,50V
C229	NCB31EK-103A	CAPACITOR	0.01μF,25V	C305	NCT08CH-330A	CAPACITOR	33PF
C230	QEF81AM-105	TANTAL CAPACITOR	1μF,10V	C306	NCT08CH-390A	CAPACITOR	39PF
C231	NCB31EK-103A	CAPACITOR	0.01μF,25V	C307	NCT08CH-100A	CAPACITOR	10PF
C232	NCB31EK-103A	CAPACITOR	0.01μF,25V	C308	NCT08CH-470A	CAPACITOR	47PF
C233	NCB31EK-103A	CAPACITOR	0.01μF,25V	C310	NCB31EK-103A	CAPACITOR	0.01μF,25V
C234	NCB31EK-103A	CAPACITOR	0.01μF,25V	C311	NCB31EK-103A	CAPACITOR	0.01μF,25V
C235	QEF81VM-224	TANTAL CAPACITOR	0.22μF,35V	C315	NEH11CM-476NP	E CAPACITOR	47μF,16V
C236	NCB31EK-103A	CAPACITOR	0.01μF,25V	C317	NCB31EK-103A	CAPACITOR	0.01μF,25V
C237	QAT3001-015	TRIMMER, PILOT BURST PHASE		C318	NCB31HK-103A	CAPACITOR	0.01μF,50V
C238	NCS31HJ-5R0A	CAPACITOR	5PF,50V	C319	NCR21CK-563A	CAPACITOR	0.056μF,16V
C239	NCB31EK-103A	CAPACITOR	0.01μF,25V	C320	NCB31EK-103A	CAPACITOR	0.01μF,25V
C240	NCB31EK-103A	CAPACITOR	0.01μF,25V	C321	NCB31EK-103A	CAPACITOR	0.01μF,25V
C241	NCB31EK-103A	CAPACITOR	0.01μF,25V	C322	NCB31EK-103A	CAPACITOR	0.01μF,25V
C242	NCB31EK-103A	CAPACITOR	0.01μF,25V	C323	NCB31HK-103A	CAPACITOR	0.01μF,50V
C243	NCB31EK-103A	CAPACITOR	0.01μF,25V	C324	NCB31EK-103A	CAPACITOR	0.01μF,25V
C244	QEF80JM-106	TANTAL CAPACITOR	10μF,6.3V	C325	NEH11EM-336NP	E CAPACITOR	33μF,25V
C245	QEF80JM-106	TANTAL CAPACITOR	10μF,6.3V	C326	NEH11HM-225NZ	E CAPACITOR	2.2μF,50V
C246	NCB31EK-103A	CAPACITOR	0.01μF,25V	C328	NEH11CM-106N	TANTAL CAPACITOR	10μF,16V
C247	NCB31EK-103A	CAPACITOR	0.01μF,25V	C330	NCT08CH-220A	CAPACITOR	22PF
C248	NCB31EK-103A	CAPACITOR	0.01μF,25V	C331	NCS31HJ-7R0A	CAPACITOR	7PF,50V
C249	QEF80JM-106	TANTAL CAPACITOR	10μF,6.3V	C332	NCB31EK-103A	CAPACITOR	0.01μF,25V
C250	QEF80JM-106	TANTAL CAPACITOR	10μF,6.3V	C333	NEN11EM-475NZ	NP E CAPACITOR	4.7μF,25V
C251	QEF80JM-475	TANTAL CAPACITOR	4.7μF,6.3V	C334	NEH11HM-225NZ	E CAPACITOR	2.2μF,50V
C252	QEF80JM-475	TANTAL CAPACITOR	4.7μF,6.3V	C335	NEH11CM-106N	E CAPACITOR	10μF,16V
C253	NCB31EK-103A	CAPACITOR	0.01μF,25V	C336	NCS31HJ-100A	CAPACITOR	10PF,50V
C254	QEF81AM-475	TANTAL CAPACITOR	4.7μF,10V	C337	NCB31EK-103A	CAPACITOR	0.01μF,25V
C255	QAT3001-017	TRIMMER CAPACITOR, VCO	010μF	C338	NCS31HJ-270A	CAPACITOR	27PF,50V
C256	NCB31CK-223A	CAPACITOR	0.022μF,16V	C339	NEH11CM-106N	E CAPACITOR	10μF,16V
C257	NCB31CK-223A	CAPACITOR	0.022μF,16V	C340	NCT08CH-330A	CAPACITOR	33PF
C258	QEF80JM-106	TANTAL CAPACITOR	10μF,6.3V	C341	NEH11CM-106N	E CAPACITOR	10μF,16V
C259	NCB31EK-103A	CAPACITOR	0.01μF,25V	C342	NCS31HJ-151A	CAPACITOR	150PF,50V
C261	NCS31HJ-471A	CAPACITOR	470PF,50V	C343	NCF31CZ-104A	CAPACITOR	0.1μF,16V
C262	QEF80JM-225	TANTAL CAPACITOR	2.2μF,6.3V	C344	NCB31EK-103A	CAPACITOR	0.01μF,25V
C263	QEF81AM-105	TANTAL CAPACITOR	1μF,10V	C345	NEH11CM-106N	E CAPACITOR	10μF,16V
C264	NCB31EK-153A	CAPACITOR	0.015μF,25V	C346	NCT08CH-270A	CAPACITOR	27PF
C265	QEF81CM-335	TANTAL CAPACITOR	3.3μF,16V	C347	QEF80JM-475	TANTAL CAPACITOR	4.7μF,6.3V
C266	NCB31EK-103A	CAPACITOR	0.01μF,25V	C348	NCS31HJ-270A	CAPACITOR	27PF,50V
C267	NCS31HJ-121A	CAPACITOR	120PF,50V	C349	NCS31HJ-820A	CAPACITOR	82PF,50V
C268	QAT3001-017	TRIMMER CAPACITOR, VCXO	010μF	C350	NCS31HJ-820A	CAPACITOR	82PF,50V
C269	NCB31HK-102A	CAPACITOR	0.001μF,50V				
C270	NCS31HJ-5R0A	CAPACITOR	5PF,50V				

#△ REF No.	PART No.	PART NAME, DESCRIPTION		#△ REF No.	PART No.	PART NAME, DESCRIPTION	
C351	NCB31HK-103A	CAPACITOR	0.01μF,50V	LPF2	PGZ01892	LOW PASS FILTER	
C352	NCS31HJ-681A	CAPACITOR	680PF,50V	LPF3	PELN0320	LOW PASS FILTER	
C353	NEH11CM-106N	E CAPACITOR	10μF,16V	LPF4	PGZ01898-R	LOW PASS FILTER	
C354	NEH11CM-106N	E CAPACITOR	10μF,16V	LPF5	PGZ01328	LOW PASS FILTER	
				LPF6	PGZ01329	LOW PASS FILTER	
C500	QCF31HP-103	CAPACITOR	0.01μF,50V				
L1	YU41134-470JY	COIL	47μH	BPF1	PGZ01893	BAND PASS FILTER	
L2	YU41134-470JY	COIL	47μH	BPF2	PGZ01889-P	BAND PASS FILTER	
L3	YU41134-470JY	COIL	47μH	BPF3	PGZ01890-P	BAND PASS FILTER	
L4	YU41134-470JY	COIL	47μH				
L5	YU41134-470JY	COIL	47μH	DL1	PGZ00130-002	DELAY LINE	
L6	YU41134-470JY	COIL	47μH	DL3	PU58971-3	COMB FILTER	
L7	PU58201-471J	COIL	470μH				
L8	YU41134-470JY	COIL	47μH	X1	PGZ01818	CRYSTAL RESONATOR	
L9	YU41134-470JY	COIL	47μH				
L10	YU41134-470JY	COIL	47μH				
L11	PU58201-150J	COIL	15μH	SW1	PU54440	SWITCH	
L12	PU58201-150J	COIL	15μH				
L13	YU41134-470JY	COIL	47μH	△ K1	PGZ00627Z	FERRITE BEADS	
L14	PU58201-221J	COIL	220μH	△ K2	PGZ00627Z	FERRITE BEADS	
L15	YU41134-470JY	COIL	47μH	△ K3	PGZ00627Z	FERRITE BEADS	
L16	YU41134-470JY	COIL	47μH	△ K4	PGZ00627Z	FERRITE BEADS	
L19	YU41134-470JY	COIL	47μH				
L21	YU41134-470JY	COIL	47μH	TH1	ERT-D2FGL101S	THERMISTOR	
L22	YU41134-470JY	COIL	47μH	TH2	ERSA22J-272	T.RESISTOR	
L23	YU41134-470JY	COIL	47μH	TH3	ERT-D2FGL101S	THERMISTOR	
L24	YU41134-470JY	COIL	47μH	TH4	QRD161J-0R0	RESISTOR	0Ω, 1/6W
L25	PU58201-180J	COIL	18μH				
L26	YU41134-470JY	COIL	47μH	CL1	PGD40786	CLAMPER	
L27	PU58201-680J	COIL	68μH				
L28	PU54710-822	COIL	8.2mH	TP1	PGZ01015	TEST PIN, X32	
L29	PU58201-8R2J	COIL	8.2μH	TP6	PU56008	TEST-PIN	
L30	PGZ01895	COIL, CNR DELAY					
L31	YU41134-470JY	COIL	47μH	CN1	PGZ01719-30	CONNECTOR	
L32	PU58201-101J	COIL	100μH	CN3	PGZ00723-10	CONNECTOR	
L33	PU58201-221J	COIL	220μH	CN4	PGZ00723-13	CONNECTOR	
L35	PU58201-181J	COIL	180μH	CN7	PGZ01756-10	CONNECTOR	
L36	PU58201-150J	COIL	15μH	CN8	PGZ01756-09	CONNECTOR	
L37	PU58201-560J	COIL	56μH				
L38	PU58201-180J	COIL	18μH				
L39	PU58201-100J	COIL	10μH				
L40	PU58201-470J	COIL	47μH				
L41	PU58201-151J	COIL	150μH				
L50	YU41134-470JY	COIL	47μH				
L53	PU54710-822	COIL	8.2mH				
L54	YU41134-470JY	COIL	47μH	DL101	PELN0565	2H DELAY LINE	
L55	PU58201-101J	COIL	100μH				
L56	PU58201-330J	COIL	33μH				
EQ1	PGZ01445	EQUALIZER					
EQ2	PGZ01897-R	EQUALIZER					
LPF1	PGZ01892	LOW PASS FILTER					

- DL BOARD ASSEMBLY <29> -

PWBA PRK20252A DL BOARD ASSY

DL101 PELN0565 2H DELAY LINE

CN1 PGZ00190-004 CONNECTOR

<02>

#△ REF No.	PART No.	PART NAME, DESCRIPTION

C RF BOARD ASSEMBLY <02>

PWBA	PRK20221A-01	C RF BOARD ASSY
IC1	TA7347P	IC
IC2	TA8733F	IC
IC4	AN6308S	IC
IC5	AN2020S	IC
Q1	2SC4081(QRS)	TRANSISTOR
Q2	2SC4081(QRS)	TRANSISTOR
Q3	2SA1576(QRS)	TRANSISTOR
Q4	2SA1576(QRS)	TRANSISTOR
Q5	DTC144EU	TRANSISTOR
Q6	2SC4081(QRS)	TRANSISTOR
Q7	2SC4081(QRS)	TRANSISTOR
Q8	DTC144EU	TRANSISTOR
Q10	2SB709A(QR)	TRANSISTOR
Q11	DTC144EU	TRANSISTOR
Q12	DTC144EU	TRANSISTOR
Q13	2SC4081(QRS)	TRANSISTOR
Q14	2SA1576(QRS)	TRANSISTOR
Q15	2SC4081(QRS)	TRANSISTOR
Q16	2SA1576(QRS)	TRANSISTOR
Q17	2SC4081(QRS)	TRANSISTOR
Q18	2SB709A(QR)	TRANSISTOR
Q19	DTC144EU	TRANSISTOR
Q20	2SC4081(QRS)	TRANSISTOR
Q21	2SA1576(QRS)	TRANSISTOR
Q22	2SA1576(QRS)	TRANSISTOR
Q23	DTC144EU	TRANSISTOR
Q24	2SA1576(QRS)	TRANSISTOR
Q25	2SC4081(QRS)	TRANSISTOR
Q26	2SC4081(QRS)	TRANSISTOR
Q27	DTC144EU	TRANSISTOR
Q28	2SC4081(QRS)	TRANSISTOR
Q29	2SC4081(QRS)	TRANSISTOR
Q30	2SC4081(QRS)	TRANSISTOR
Q31	2SC4081(QRS)	TRANSISTOR
Q32	2SC4081(QRS)	TRANSISTOR
Q33	2SC4081(QRS)	TRANSISTOR
Q34	2SC4081(QRS)	TRANSISTOR
Q35	2SC4081(QRS)	TRANSISTOR
Q36	2SC4081(QRS)	TRANSISTOR
Q37	2SC4081(QRS)	TRANSISTOR
Q38	2SC4081(QRS)	TRANSISTOR
Q39	2SC4081(QRS)	TRANSISTOR
Q40	2SA1576(QRS)	TRANSISTOR
Q41	2SC4081(QRS)	TRANSISTOR
Q42	2SC4081(QRS)	TRANSISTOR
Q43	2SA1576(QRS)	TRANSISTOR
Q44	DTC144EU	TRANSISTOR
Q45	2SA1576(QRS)	TRANSISTOR
Q46	2SA1576(QRS)	TRANSISTOR

#△ REF No.	PART No.	PART NAME, DESCRIPTION	
D1	MA157	DIODE	
D2	DAN202U	DIODE	
R1	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W
R2	NRSA63J-181N	RESISTOR	180Ω,1/16W
R3	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R4	NVP1415-502N	V RESISTOR, VHS REC FM LEV	5KΩ,1/4W
R5	NVP1415-502N	V RESISTOR, S-VHS REC FM LEV	5KΩ,1/4W
R6	NRSA63J-392N	RESISTOR	3.9KΩ,1/16W
R7	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R8	NRSA63J-392N	RESISTOR	3.9KΩ,1/16W
R9	NRSA63J-391N	RESISTOR	390Ω,1/16W
R10	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R11	NRSA63J-391N	RESISTOR	390Ω,1/16W
R12	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R13	NRSA63J-101N	RESISTOR	100Ω,1/16W
R14	NRSA63J-0R0N	RESISTOR	0Ω,1/16W
R15	NRSA63J-182N	RESISTOR	1.8KΩ,1/16W
R16	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W
R17	NRSA63J-821N	RESISTOR	820Ω,1/16W
R18	NRSA63J-332N	RESISTOR	3.3KΩ,1/16W
R19	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R20	NRSA63J-823N	RESISTOR	82KΩ,1/16W
R21	NRSA63J-332N	RESISTOR	3.3KΩ,1/16W
R22	NRSA63J-681N	RESISTOR	680Ω,1/16W
R25	NRSA63J-0R0N	RESISTOR	0Ω,1/16W
R26	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R27	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R28	NRSA63J-681N	RESISTOR	680Ω,1/16W
R29	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R30	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R31	NRSA63J-681N	RESISTOR	680Ω,1/16W
R32	NVP1415-202N	V RESISTOR, VHS EQ	2KΩ,1/4W
R33	NRSA63J-821N	RESISTOR	820Ω,1/16W
R34	NRSA63J-681N	RESISTOR	680Ω,1/16W
R35	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R36	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R37	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R38	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W
R39	NRSA63J-182N	RESISTOR	1.8KΩ,1/16W
R40	NRSA63J-331N	RESISTOR	330Ω,1/16W
R41	NRSA63J-182N	RESISTOR	1.8KΩ,1/16W
R42	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R43	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R44	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R45	NRSA63J-681N	RESISTOR	680Ω,1/16W
R46	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R47	NRSA63J-273N	RESISTOR	27KΩ,1/16W
R48	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R49	NVP1415-202N	V RESISTOR, S-VHS EQ CH-1	2KΩ,1/4W
R50	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W
R51	NRSA63J-273N	RESISTOR	27KΩ,1/16W
R52	NRSA63J-153N	RESISTOR	15KΩ,1/16W
R53	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R54	NVP1415-202N	V RESISTOR, S-VHS EQ CH-2	2KΩ,1/4W

#△ REF No.	PART No.	PART NAME, DESCRIPTION		#△ REF No.	PART No.	PART NAME, DESCRIPTION	
R55	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W	R112	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R56	NRSA63J-122N	RESISTOR	1.2KΩ,1/16W	R113	NRSA63J-821N	RESISTOR	820Ω,1/16W
R58	NRSA63J-0R0N	RESISTOR	0Ω,1/16W	R114	NRSA63J-821N	RESISTOR	820Ω,1/16W
R59	NRSA63J-182N	RESISTOR	1.8KΩ,1/16W	R115	NRSA63J-561N	RESISTOR	560Ω,1/16W
R60	NRSA63J-223N	RESISTOR	22KΩ,1/16W	R116	NRSA63J-0R0N	RESISTOR	0Ω,1/16W
R61	NRSA63J-223N	RESISTOR	22KΩ,1/16W	R117	NRSA63J-332N	RESISTOR	3.3KΩ,1/16W
R62	NRSA63J-182N	RESISTOR	1.8KΩ,1/16W	R118	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R63	NRSA63J-223N	RESISTOR	22KΩ,1/16W	R119	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R64	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R120	NRSA63J-331N	RESISTOR	330Ω,1/16W
R65	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R125	NRSA63J-331N	RESISTOR	330Ω,1/16W
R66	NRSA63J-223N	RESISTOR	22KΩ,1/16W	C1	NCB31EK-103A	CAPACITOR	0.01μF,25V
R67	NRSA63J-102N	RESISTOR	1KΩ,1/16W	C3	NCB31EK-103A	CAPACITOR	0.01μF,25V
R68	NVP1415-202N	V RESISTOR, S-VHS REC DELAY 2KΩ,1/4W		C4	NCB31EK-103A	CAPACITOR	0.01μF,25V
R69	NRSA63J-102N	RESISTOR	1KΩ,1/16W	C5	NCS31HJ-121A	CAPACITOR	120PF,50V
R70	NRSA63J-102N	RESISTOR	1KΩ,1/16W	C6	NCF31CZ-104A	CAPACITOR	0.1μF,16V
R71	NRSA63J-102N	RESISTOR	1KΩ,1/16W	C7	NCB31EK-103A	CAPACITOR	0.01μF,25V
R72	NRSA63J-102N	RESISTOR	1KΩ,1/16W	C8	NCS31HJ-330A	CAPACITOR	33PF,50V
R73	NVP1415-202N	V RESISTOR, VHS REC DELAY2KΩ,1/4W		C9	NCB31EK-103A	CAPACITOR	0.01μF,25V
R74	NRSA63J-102N	RESISTOR	1KΩ,1/16W	C10	NEH11EM-336NP	E CAPACITOR	33μF,25V
R75	NRSA63J-103N	RESISTOR	10KΩ,1/16W	C11	NCB31EK-103A	CAPACITOR	0.01μF,25V
R76	NRSA63J-181N	RESISTOR	180Ω,1/16W	C12	NCB31EK-103A	CAPACITOR	0.01μF,25V
R77	NRSA63J-103N	RESISTOR	10KΩ,1/16W	C14	NCB31EK-103A	CAPACITOR	0.01μF,25V
R78	NRSA63J-752N	RESISTOR	7.5KΩ,1/16W	C15	NCF31CZ-104A	CAPACITOR	0.1μF,16V
R79	NRSA63J-102N	RESISTOR	1KΩ,1/16W	C16	NCB31EK-103A	CAPACITOR	0.01μF,25V
R80	NRSA63J-223N	RESISTOR	22KΩ,1/16W	C17	NEH11EM-336NP	E CAPACITOR	33μF,25V
R81	NRSA63J-223N	RESISTOR	22KΩ,1/16W	C21	NCS31HJ-220A	CAPACITOR	22PF,50V
R82	NRSA63J-221N	RESISTOR	220Ω,1/16W	C22	NCB31EK-103A	CAPACITOR	0.01μF,25V
R83	NRSA63J-221N	RESISTOR	220Ω,1/16W	C23	NCS31HJ-270A	CAPACITOR	27PF,50V
R84	NRSA63J-221N	RESISTOR	220Ω,1/16W	C24	NCB31EK-103A	CAPACITOR	0.01μF,25V
R85	NRSA63J-221N	RESISTOR	220Ω,1/16W	C27	NCS31HJ-271A	CAPACITOR	270PF,50V
R86	NRSA63J-221N	RESISTOR	220Ω,1/16W	C28	NCB31HK-102A	CAPACITOR	0.001μF,50V
R87	NRSA63J-102N	RESISTOR	1KΩ,1/16W	C29	NCS31HJ-331A	CAPACITOR	330PF,50V
R88	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W	C30	NCS31HJ-470A	CAPACITOR	47PF,50V
R89	NRSA63J-102N	RESISTOR	1KΩ,1/16W	C31	NCB31EK-103A	CAPACITOR	0.01μF,25V
R90	NRSA63J-153N	RESISTOR	15KΩ,1/16W	C32	NCB31EK-103A	CAPACITOR	0.01μF,25V
R91	NRSA63J-103N	RESISTOR	10KΩ,1/16W	C33	NEH11EM-336NP	E CAPACITOR	33μF,25V
R92	NRSA63J-561N	RESISTOR	560Ω,1/16W	C34	NCB31EK-103A	CAPACITOR	0.01μF,25V
R93	NRSA63J-561N	RESISTOR	560Ω,1/16W	C35	NCS31HJ-220A	CAPACITOR	22PF,50V
R94	NRSA63J-152N	RESISTOR	1.5KΩ,1/16W	C36	NCB31EK-103A	CAPACITOR	0.01μF,25V
R95	NRSA63J-561N	RESISTOR	560Ω,1/16W	C38	NCB31EK-103A	CAPACITOR	0.01μF,25V
R96	NRSA63J-561N	RESISTOR	560Ω,1/16W	C40	NCB31EK-103A	CAPACITOR	0.01μF,25V
R97	NRSA63J-100N	RESISTOR	10Ω,1/16W	C41	NCS31HJ-271A	CAPACITOR	270PF,50V
R98	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W	C42	NCS31HJ-271A	CAPACITOR	270PF,50V
R99	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W	C44	NCB31CK-223A	CAPACITOR	0.022μF,16V
R100	NRSA63J-391N	RESISTOR	390Ω,1/16W	C45	NCS31HJ-101A	CAPACITOR	100PF,50V
R101	NRSA63J-471N	RESISTOR	470Ω,1/16W	C46	NCB31EK-103A	CAPACITOR	0.01μF,25V
R102	NRSA63J-391N	RESISTOR	390Ω,1/16W	C47	NCB31EK-103A	CAPACITOR	0.01μF,25V
R103	NRSA63J-151N	RESISTOR	150Ω,1/16W	C48	NEH11EM-336NP	E CAPACITOR	33μF,25V
R104	NRSA63J-102N	RESISTOR	1KΩ,1/16W	C49	NCB31EK-103A	CAPACITOR	0.01μF,25V
R105	NVP1415-102N	V RESISTOR, VHS REC COLOR LEV 1KΩ,1/4W		C50	NCS31HJ-151A	CAPACITOR	150PF,50V
R106	NRSA63J-333N	RESISTOR	33KΩ,1/16W	C51	NCS31HJ-151A	CAPACITOR	150PF,50V
R107	NRSA63J-223N	RESISTOR	22KΩ,1/16W	C52	NCB31EK-103A	CAPACITOR	0.01μF,25V
R108	NVP1415-102N	V RESISTOR, S-VHS REC C LEV 1KΩ,1/4W		C53	NCB31EK-103A	CAPACITOR	0.01μF,25V
R109	NRSA63J-102N	RESISTOR	1KΩ,1/16W	C54	NCB31EK-103A	CAPACITOR	0.01μF,25V
R110	NRSA63J-103N	RESISTOR	10KΩ,1/16W				
R111	NRSA63J-473N	RESISTOR	47KΩ,1/16W				

<02><03>

#△ REF No.	PART No.	PART NAME, DESCRIPTION	
C55	NCB31EK-103A	CAPACITOR	0.01μF,25V
C56	NCB31CK-223A	CAPACITOR	0.022μF,16V
C57	NCB31EK-103A	CAPACITOR	0.01μF,25V
C58	NCB31EK-103A	CAPACITOR	0.01μF,25V
C59	NCB31EK-103A	CAPACITOR	0.01μF,25V
C60	NCB31EK-103A	CAPACITOR	0.01μF,25V
C61	NCB31EK-103A	CAPACITOR	0.01μF,25V
C62	NCB31EK-103A	CAPACITOR	0.01μF,25V
C63	NCS31HJ-681A	CAPACITOR	680PF,50V
C64	NCB31EK-103A	CAPACITOR	0.01μF,25V
C65	NCS31HJ-151A	CAPACITOR	150PF,50V
C66	NEH11CM-106N	E CAPACITOR	10μF,16V
C67	NCB31EK-103A	CAPACITOR	0.01μF,25V
C68	NCS31HJ-101A	CAPACITOR	100PF,50V
C69	NCS31HJ-100A	CAPACITOR	10PF,50V
C70	NCB31EK-103A	CAPACITOR	0.01μF,25V
C71	NCB31EK-103A	CAPACITOR	0.01μF,25V
C72	NCB31EK-103A	CAPACITOR	0.01μF,25V
C73	NCB31EK-103A	CAPACITOR	0.01μF,25V
C74	NCB31EK-103A	CAPACITOR	0.01μF,25V
C75	NEH11EM-336NP	E CAPACITOR	33μF,25V
C76	NCB31EK-103A	CAPACITOR	0.01μF,25V
C77	NEH11CM-106N	E CAPACITOR	10μF,16V
C79	NCB31EK-103A	CAPACITOR	0.01μF,25V
C80	NCS31HJ-680A	CAPACITOR	68PF,50V
C83	NCS31HJ-120A	CAPACITOR	12PF,50V
C84	NCS31HJ-681A	CAPACITOR	680PF,50V
L1	YU41134-470JY	COIL	47μH
L2	PU58201-4R7J	COIL	4.7μH
L3	YU41134-470JY	COIL	47μH
L4	PU58201-5R6J	COIL	5.6μH
L5	YU41134-470JY	COIL	47μH
L6	PU58201-560J	COIL	56μH
L8	PU58201-221J	COIL	220μH
L9	PU58201-560J	COIL	56μH
L10	PU58201-150J	COIL	15μH
L11	YU41134-470JY	COIL	47μH
L12	PU58201-270J	COIL	27μH
L14	PU58201-221J	COIL	220μH
L15	PU58201-150J	COIL	15μH
L16	PU58201-101J	COIL	100μH
L17	PU58201-5R6J	COIL	5.6μH
L18	PU58201-390J	COIL	39μH
L19	YU41134-470JY	COIL	47μH
L21	PU58201-220J	COIL	22μH
L22	PU58201-180J	COIL	18μH
L23	PU58201-221J	COIL	220μH
TP1	PGZ01015	TEST PIN, X7	
CN1	PGZ00724-10	CONNECTOR	
CN2	PGZ00724-13	CONNECTOR	

#△ REF No. PART No. PART NAME, DESCRIPTION

A EQ BOARD ASSEMBLY <03>

PWBA	PRK20170B	AUTO EQ BOARD ASSY	
IC1	JCL0009	IC	
IC2	MN3106S	IC	
IC3	TC4S69F	IC	
Q1	DTC144EU	TRANSISTOR	
Q2	DTA144EU	TRANSISTOR	
Q3	DTC144EU	TRANSISTOR	
Q4	2SB709A(QR)	TRANSISTOR	
Q5	DTA144EU	TRANSISTOR	
Q8	2SA1576(QRS)	TRANSISTOR	
Q9	2SC4081(QRS)	TRANSISTOR	
Q10	2SC4081(QRS)	TRANSISTOR	
Q11	2SC4081(QRS)	TRANSISTOR	
Q12	2SA1576(QRS)	TRANSISTOR	
Q193	2SA1576(QRS)	TRANSISTOR	
Q194	2SA1576(QRS)	TRANSISTOR	
Q195	DTC144EU	TRANSISTOR	
R1	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R2	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R3	NRSA63J-122N	RESISTOR	1.2KΩ,1/16W
R4	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R5	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R6	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R7	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R8	NRSA63J-0R0N	RESISTOR	0Ω,1/16W
R10	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R12	NRSA63J-0R0N	RESISTOR	0Ω,1/16W
R13	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R14	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R15	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R16	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R25	NRSA63J-473N	RESISTOR	47KΩ,1/16W
R26	NRSA63J-273N	RESISTOR	27KΩ,1/16W
R27	NRSA63J-562N	RESISTOR	5.6KΩ,1/16W
R28	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R29	NVP1415-102N	V RESISTOR, AUTO EQ 625KHZ	1KΩ,1/4W
R30	NRSA63J-473N	RESISTOR	47KΩ,1/16W
R31	NRSA63J-333N	RESISTOR	33KΩ,1/16W
R32	NRSA63J-272N	RESISTOR	2.7KΩ,1/16W
R33	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R34	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R35	NRSA63J-272N	RESISTOR	2.7KΩ,1/16W
R36	NRSA63J-473N	RESISTOR	47KΩ,1/16W
R37	NRSA63J-333N	RESISTOR	33KΩ,1/16W
R38	NVP1415-102N	V RESISTOR, AUTO EQ 3.8MHZ	1KΩ,1/4W
R39	NRSA63J-0R0N	RESISTOR	0Ω,1/16W
R40	NRSA63J-102N	RESISTOR	1KΩ,1/16W

#△ REF No.	PART No.	PART NAME, DESCRIPTION		#△ REF No.	PART No.	PART NAME, DESCRIPTION	
R41	NRSA63J-102N	RESISTOR	1KΩ,1/16W	C285	NCB31EK-103A	CAPACITOR	0.01μF,25V
R42	NRSA63J-102N	RESISTOR	1KΩ,1/16W				
R43	NRSA63J-473N	RESISTOR	47KΩ,1/16W				
R44	NRSA63J-153N	RESISTOR	15KΩ,1/16W	L1	PU58201-101J	COIL	100μH
R46	NRSA63J-472N	RESISTOR	4.7KΩ,1/16W	L3	PU58201-101J	COIL	100μH
R50	NRSA63J-472N	RESISTOR	4.7KΩ,1/16W	L5	PU58201-101J	COIL	100μH
				L7	PU58201-101J	COIL	100μH
R51	NRSA63J-102N	RESISTOR	1KΩ,1/16W				
R52	NRSA63J-102N	RESISTOR	1KΩ,1/16W	L52	PU58201-331J	COIL	330μH
R53	NRSA63J-101N	RESISTOR	100Ω,1/16W	L53	PU58201-560J	COIL	56μH
				L54	PU58201-331J	COIL	330μH
R181	NRSA63J-0R0N	RESISTOR	0Ω,1/16W	L55	PU58201-680J	COIL	68μH
R182	NRSA63J-0R0N	RESISTOR	0Ω,1/16W	L56	PU58201-101J	COIL	100μH
R394	NRSA63J-102N	RESISTOR	1KΩ,1/16W				
R396	NRSA63J-102N	RESISTOR	1KΩ,1/16W	LPF1	PGZ01329	LOW PASS FILTER	
R397	NRSA63J-102N	RESISTOR	1KΩ,1/16W				
R398	NRSA63J-223N	RESISTOR	22KΩ,1/16W				
R399	NRSA63J-223N	RESISTOR	22KΩ,1/16W	BPF1	YU40507-R	BAND PASS FILTER(3.58M)	
R400	NRSA63J-102N	RESISTOR	1KΩ,1/16W				
R401	NRSA63J-273N	RESISTOR	27KΩ,1/16W	SW1	PGZ01681-06	DIP SWITCH	
R402	NRSA63J-103N	RESISTOR	10KΩ,1/16W				
R403	NRSA63J-102N	RESISTOR	1KΩ,1/16W				
R404	NRSA63J-102N	RESISTOR	1KΩ,1/16W	△ K1	PGZ00627Z	FERRITE BEADS	
				△ K2	PGZ00627Z	FERRITE BEADS	
R461	NRSA63J-0R0N	RESISTOR	0Ω,1/16W	△ K5	PGZ00627Z	FERRITE BEADS	
R462	NRSA63J-103N	RESISTOR	10KΩ,1/16W	K6	PGZ00627Z	FERRITE BEADS	
				K7	PGZ00627Z	FERRITE BEADS	
C1	NCB31EK-103A	CAPACITOR	0.01μF,25V				
C2	QEF81CM-106	TANTAL CAPACITOR	10μF,16V	TP1	PGZ01015	TEST PIN, X2(TP1,9)	
C5	NCB31EK-103A	CAPACITOR	0.01μF,25V				
C6	QEF81CM-106	TANTAL CAPACITOR	10μF,16V				
C7	NCS31HJ-271A	CAPACITOR	270PF,50V	CN1	PGZ00724-10	CONNECTOR	
C8	NCS31HJ-101A	CAPACITOR	100PF,50V	CN2	PGZ00724-09	CONNECTOR	
C9	NCB31EK-103A	CAPACITOR	0.01μF,25V				
C10	NCB31EK-103A	CAPACITOR	0.01μF,25V				
C11	NCB31EK-103A	CAPACITOR	0.01μF,25V				
C12	NCB31EK-103A	CAPACITOR	0.01μF,25V	*****			
C13	NCB31EK-103A	CAPACITOR	0.01μF,25V				
C21	NCB31EK-103A	CAPACITOR	0.01μF,25V				
C24	QEF81AM-225	TANTAL CAPACITOR	2.2μF,10V	PWBA	PRK20245A-01	PRE/REC BOARD ASSY	
C25	NCB31EK-103A	CAPACITOR	0.01μF,25V				
C26	QEF80JM-476	TANTAL CAPACITOR	47μF,6.3V				
C27	NCB31EK-103A	CAPACITOR	0.01μF,25V	IC1	BA7743FS	IC	
C28	NCB31EK-472A	CAPACITOR	0.0047μF,25V	IC3	TC4S71F	IC	
				IC6	UPC2320GS	IC	
C85	NCB31EK-103A	CAPACITOR	0.01μF,25V	IC7	5VT51	IC	
C268	NCS31HJ-151A	CAPACITOR	150PF,50V				
C270	NCS31HJ-151A	CAPACITOR	150PF,50V	Q1	2SA1577(PQ)	TRANSISTOR	
				Q2	DTA114EU	TRANSISTOR	
C273	NCB31EK-103A	CAPACITOR	0.01μF,25V	Q3	DTC144EU	TRANSISTOR	
C275	NCS31HJ-221A	CAPACITOR	220PF,50V	Q6	2SA1577(PQ)	TRANSISTOR	
C276	NCB31EK-103A	CAPACITOR	0.01μF,25V	Q10	DTC144EU	TRANSISTOR	
C277	QEF80JM-476	TANTAL CAPACITOR	47μF,6.3V				
C279	NCS31HJ-330A	CAPACITOR	33PF,50V	Q11	2SC4081(QRS)	TRANSISTOR	
				Q12	2SC4081(QRS)	TRANSISTOR	
C282	NCS31HJ-121A	CAPACITOR	120PF,50V	Q14	2SC4081(QRS)	TRANSISTOR	

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#△ REF No.	PART No.	PART NAME, DESCRIPTION		#△ REF No.	PART No.	PART NAME, DESCRIPTION	
Q21	DTC124EU	TRANSISTOR		C1	NCB31EK-103A	CAPACITOR	0.01μF,25V
Q22	2SA1577(PQ)	TRANSISTOR		C2	NCS31HJ-101A	CAPACITOR	100PF,50V
				C3	QCF81CZ-105	CAPACITOR	1μF,16V
Q32	2SA1577(PQ)	TRANSISTOR		C4	NCS31HJ-271A	CAPACITOR	270PF,50V
Q34	DTC124EU	TRANSISTOR		C5	NCS31HJ-271A	CAPACITOR	270PF,50V
				C6	NCB31HK-821A	CAPACITOR	820PF,50V
				C7	NCB31HK-821A	CAPACITOR	820PF,50V
D2	DAN202U	DIODE		C8	QCF81CZ-105	CAPACITOR	1μF,16V
D3	DAN202U	DIODE		C9	NEH10JM-107NP	E CAPACITOR	100μF,6.3V
				C10	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R1	NRSA63J-224N	RESISTOR	220KΩ,1/16W	C11	NCB31HK-102A	CAPACITOR	0.001μF,50V
R2	NRSA63J-100N	RESISTOR	10Ω,1/16W	C12	NCB31HK-102A	CAPACITOR	0.001μF,50V
R3	NRSA63J-102N	RESISTOR	1KΩ,1/16W	C13	NCB31EK-103A	CAPACITOR	0.01μF,25V
R4	NRSA63J-122N	RESISTOR	1.2KΩ,1/16W	C14	NCB31EK-103A	CAPACITOR	0.01μF,25V
R5	NRSA63J-561N	RESISTOR	560Ω,1/16W	C15	NCB31EK-103A	CAPACITOR	0.01μF,25V
R6	NRSA63J-561N	RESISTOR	560Ω,1/16W	C16	NEH10JM-107NP	E CAPACITOR	100μF,6.3V
R7	NRSA63J-122N	RESISTOR	1.2KΩ,1/16W	C17	NCB31EK-103A	CAPACITOR	0.01μF,25V
R8	NRSA63J-103N	RESISTOR	10KΩ,1/16W	C18	NCB31EK-103A	CAPACITOR	0.01μF,25V
R9	NRSA63J-102N	RESISTOR	1KΩ,1/16W	C19	NCB31EK-103A	CAPACITOR	0.01μF,25V
R10	NRSA63J-223N	RESISTOR	22KΩ,1/16W				
R11	NRSA63J-223N	RESISTOR	22KΩ,1/16W	C29	QCYA1EK-104	CAPACITOR	0.1μF,25V
R12	NRSA63J-472N	RESISTOR	4.7KΩ,1/16W	C30	NEH11CM-476NP	E CAPACITOR	47μF,16V
R13	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W				
R14	NRSA63J-912N	RESISTOR	9.1KΩ,1/16W	C31	QCYA1EK-104	CAPACITOR	0.1μF,25V
R15	NRSA63J-103N	RESISTOR	10KΩ,1/16W	C32	NCB31EK-103A	CAPACITOR	0.01μF,25V
R16	NRSA63J-223N	RESISTOR	22KΩ,1/16W	C33	NCB31EK-103A	CAPACITOR	0.01μF,25V
R17	NRSA63J-182N	RESISTOR	1.8KΩ,1/16W	C34	NEE21EM-474RY	E CAPACITOR	0.47μF,25V
				C35	NCB31EK-103A	CAPACITOR	0.01μF,25V
R30	NRSA63J-473N	RESISTOR	47KΩ,1/16W	C36	NCB31EK-103A	CAPACITOR	0.01μF,25V
				C37	QCYA1HK-103	CAPACITOR	0.01μF,50V
R31	NRSA63J-821N	RESISTOR	820Ω,1/16W	C38	NEH11CM-476NP	E CAPACITOR	47μF,16V
R32	NRSA63J-821N	RESISTOR	820Ω,1/16W	C39	QCYA1EK-104	CAPACITOR	0.1μF,25V
R33	NRSA63J-103N	RESISTOR	10KΩ,1/16W	C40	QCYA1EK-104	CAPACITOR	0.1μF,25V
R34	NRSA63J-821N	RESISTOR	820Ω,1/16W				
R36	NRSA63J-561N	RESISTOR	560Ω,1/16W	C41	NEE21EM-474RY	E CAPACITOR	0.47μF,25V
R37	NRSA63J-681N	RESISTOR	680Ω,1/16W	C42	QCYA1EK-104	CAPACITOR	0.1μF,25V
R38	NRSA63J-681N	RESISTOR	680Ω,1/16W	C43	QCYA1EK-104	CAPACITOR	0.1μF,25V
R39	NRSA63J-102N	RESISTOR	1KΩ,1/16W	C44	NEE21EM-474RY	E CAPACITOR	0.47μF,25V
R40	NRSA63J-0R0N	RESISTOR	0Ω,1/16W	C45	NEE21EM-474RY	E CAPACITOR	0.47μF,25V
				C46	QCYA1EK-104	CAPACITOR	0.1μF,25V
R41	NRSA63J-220N	RESISTOR	22Ω,1/16W	C47	QCYA1EK-104	CAPACITOR	0.1μF,25V
R42	NRSA63J-3R9N	RESISTOR	3.9Ω,1/16W	C48	NEE21EM-474RY	E CAPACITOR	0.47μF,25V
R43	NRSA63J-3R9N	RESISTOR	3.9Ω,1/16W	C49	QCYA1EK-104	CAPACITOR	0.1μF,25V
R44	NRSA63J-220N	RESISTOR	22Ω,1/16W	C50	QCYA1EK-104	CAPACITOR	0.1μF,25V
R45	NRSA63J-220N	RESISTOR	22Ω,1/16W				
R46	NRSA63J-220N	RESISTOR	22Ω,1/16W	C52	NCS31HJ-220A	CAPACITOR	22PF,50V
R47	NRSA63J-221N	RESISTOR	220Ω,1/16W	C53	NCS31HJ-330A	CAPACITOR	33PF,50V
R48	NRSA63J-223N	RESISTOR	22KΩ,1/16W	C54	NCB31EK-103A	CAPACITOR	0.01μF,25V
				C55	NCS31HJ-220A	CAPACITOR	22PF,50V
R51	NRSA63J-333N	RESISTOR	33KΩ,1/16W				
R52	NRSA63J-332N	RESISTOR	3.3KΩ,1/16W	C61	NCB31EK-103A	CAPACITOR	0.01μF,25V
				C62	NEE21AM-106RY	TANTAL CAPACITOR	10μF,10V
R70	NRSA63J-392N	RESISTOR	3.9KΩ,1/16W	C63	NCS31HJ-221A	CAPACITOR	220PF,50V
				C69	NCB31EK-103A	CAPACITOR	0.01μF,25V
R72	NRSA63J-223N	RESISTOR	22KΩ,1/16W				
R73	NRSA63J-223N	RESISTOR	22KΩ,1/16W	C75	NCB31EK-103A	CAPACITOR	0.01μF,25V
R80	NRSA63J-3R9N	RESISTOR	3.9Ω,1/16W	C76	NCB31EK-103A	CAPACITOR	0.01μF,25V
				C78	NCB31EK-103A	CAPACITOR	0.01μF,25V
R82	NRSA63J-0R0N	RESISTOR	0Ω,1/16W				
R84	NRSA63J-0R0N	RESISTOR	0Ω,1/16W	C81	NCB31EK-103A	CAPACITOR	0.01μF,25V

#△ REF No.	PART No.	PART NAME, DESCRIPTION	
L1	PU58201-101J	COIL	100μH
L2	PU58201-101J	COIL	100μH
L3	PU58201-101J	COIL	100μH
L7	PU58201-101J	COIL	100μH
L8	PU58201-101J	COIL	100μH
L9	PU58201-101J	COIL	100μH
L10	PELN0840-1R2MY	COIL	
L11	PU56175	S.TRANS	
SLD1	PRS40032	SHIELD CASE 1	
SLD2	PRS40033	SHIELD CASE 2	
TP1	PGZ01015	TEST PIN, X6(TP1-4,9,10)	
TP7	PU56008	TEST-PIN, X2(TP7,8)	
CN1	PGZ01938-011Z	CONNECTOR	
CN2	PGZ01932-013Z	CONNECTOR	
CN3	YU41356-9-R	CAP HOUSING,(BOARD TO BOARD)	

SYSCON/SERVO BOARD ASSEMBLY <05>

PWBA PRK30119B SYSCON/SERVO BOARD ASSY

IC1	BA6405F	IC
IC2	XRA10324F	IC
IC3	BA728F	IC
IC4	TC7W04F	IC
IC5	BA10393F	IC
IC7	BU3779S	IC
IC12	MN50005JVES	IC
IC15	TC4S584F	IC
IC16	TC4S584F	IC
IC17	M38063E6-359FP	IC
IC18	S-8054HN-CB-X	IC
IC19	TC4021BF	IC
IC20	BA6109U2	IC
IC21	M6M80011AP	IC
IC22	TC4S69F	IC
IC23	BA10339F	IC
IC24	S-81252HG	IC
IC25	TC4021BF	IC
IC27	TC4S11F	IC
IC28	M51943BML	IC
IC29	TC4W53F	IC
IC30	TC4W53F	IC
IC402	NJM2903M	IC
IC403	TC4538BF	IC
IC404	TC4S81F	IC

#△ REF No.	PART No.	PART NAME, DESCRIPTION	
IC501	TC4013BF	IC	
IC502	TC4W53F	IC	
Q1	DTC124EU	TRANSISTOR	
Q2	DTC124EU	TRANSISTOR	
Q3	DTC124EU	TRANSISTOR	
Q5	DTC124EU	TRANSISTOR	
Q6	2SB798	TRANSISTOR	
Q7	2SA1502-XE	TRANSISTOR	
Q8	2SB798	TRANSISTOR	
Q9	2SA1502-XE	TRANSISTOR	
Q10	2SC2412K(QR)	TRANSISTOR	
Q12	2SC2412K(QR)	TRANSISTOR	
Q13	DTA143ZK	TRANSISTOR	
Q14	DTA143ZK	TRANSISTOR	
Q15	DTC124EU	TRANSISTOR	
Q17	2SC2412K(QR)	TRANSISTOR	
Q18	DTA124EU	TRANSISTOR	
Q19	DTC124EU	TRANSISTOR	
Q20	2SC2412K(QR)	TRANSISTOR	
Q25	FMG1	TRANSISTOR	
Q26	FMG1	TRANSISTOR	
Q27	FMG1	TRANSISTOR	
Q28	FMC2	TRANSISTOR	
Q29	DTC144EU	TRANSISTOR	
Q30	DTC124EU	TRANSISTOR	
Q501	DTC124EU	TRANSISTOR	
D1	ERA82-004	DIODE	
D2	ERA82-004	DIODE	
D3	RD5.6ESB2	ZENER DIODE	
D4	RD6.8ESB2	ZENER DIODE	
D5	DAN202U	DIODE	
D6	DAN202U	DIODE	
D7	DA204U	DIODE	
D8	DAN202U	DIODE	
D12	RD12EB2	ZENER DIODE	
D13	RD12EB2	ZENER DIODE	
D14	RD12EB2	ZENER DIODE	
D17	RD3.3EB2	ZENER DIODE	
D18	1SS133	DIODE	
D19	RD12EB2	ZENER DIODE	
D20	RD12EB2	ZENER DIODE	
D21	RD12EB2	ZENER DIODE	
D23	RD12EB2	ZENER DIODE	
D25	MA742	DIODE	
D26	MA742	DIODE	
D28	RD9.1ESB2	ZENER DIODE	
D30	1SS99	DIODE	
D401	DAN202U	DIODE	
D402	DAN202U	DIODE	
R1	NRSA63J-392N	RESISTOR	3.9KΩ,1/16W

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#△ REF No.	PART No.	PART NAME, DESCRIPTION	#△ REF No.	PART No.	PART NAME, DESCRIPTION
R2	NRSA63J-222N	RESISTOR 2.2KΩ, 1/16W	R74	PU59237-223	V RESISTOR, TRACKING PRESET
R3	QRSA08J-472YN	RESISTOR 4.7KΩ, 1/10W	R75	NRSA63J-104N	RESISTOR 100KΩ, 1/16W
R4	QRSA08J-302YN	RESISTOR 3KΩ, 1/10W	R76	NRSA63J-563N	RESISTOR 56KΩ, 1/16W
R5	QRSA08J-471YN	RESISTOR 470Ω, 1/10W	R77	NRSA63J-562N	RESISTOR 5.6KΩ, 1/16W
R6	QRSA08J-471YN	RESISTOR 470Ω, 1/10W	R78	NRSA63J-104N	RESISTOR 100KΩ, 1/16W
R7	QRSA08J-272YN	RESISTOR 2.7KΩ, 1/10W	R79	NRSA63J-333N	RESISTOR 33KΩ, 1/16W
R8	QRSA08J-112YN	RESISTOR 1.1KΩ, 1/10W	R80	NRSA63J-333N	RESISTOR 33KΩ, 1/16W
R9	QRSA08J-304YN	RESISTOR 300KΩ, 1/10W			
R10	QRSA08J-304YN	RESISTOR 300KΩ, 1/10W	R81	NRSA63J-104N	RESISTOR 100KΩ, 1/16W
			R82	NRSA63J-104N	RESISTOR 100KΩ, 1/16W
R11	NRSA63J-104N	RESISTOR 100KΩ, 1/16W	R83	NRSA63J-222N	RESISTOR 2.2KΩ, 1/16W
R12	NRSA63J-104N	RESISTOR 100KΩ, 1/16W	R84	NRSA63J-103N	RESISTOR 10KΩ, 1/16W
R13	NRSA63J-103N	RESISTOR 10KΩ, 1/16W	R85	PU59237-474	V RESISTOR, SWITCHING POINT
R14	NRSA63J-104N	RESISTOR 100KΩ, 1/16W	R86	NRSA63J-472N	RESISTOR 4.7KΩ, 1/16W
R15	NRSA63J-105N	RESISTOR 1MΩ, 1/16W	R87	NRSA63J-124N	RESISTOR 120KΩ, 1/16W
R16	NRSA63J-102N	RESISTOR 1KΩ, 1/16W	R88	NRSA63J-102N	RESISTOR 1KΩ, 1/16W
R17	NRSA63J-474N	RESISTOR 470KΩ, 1/16W	R89	NRSA63J-102N	RESISTOR 1KΩ, 1/16W
R18	NRSA63J-471N	RESISTOR 470Ω, 1/16W	R90	NRSA63J-102N	RESISTOR 1KΩ, 1/16W
R19	NRSA63J-333N	RESISTOR 33KΩ, 1/16W			
R20	NRSA63J-392N	RESISTOR 3.9KΩ, 1/16W	R92	NRSA63J-393N	RESISTOR 39KΩ, 1/16W
			R93	NRSA63J-682N	RESISTOR 6.8KΩ, 1/16W
R21	NRSA63J-274N	RESISTOR 270KΩ, 1/16W	R94	NRSA63J-682N	RESISTOR 6.8KΩ, 1/16W
R22	NRSA63J-823N	RESISTOR 82KΩ, 1/16W	R95	NRSA63J-153N	RESISTOR 15KΩ, 1/16W
R23	NRSA63J-104N	RESISTOR 100KΩ, 1/16W	R96	NRSA63J-153N	RESISTOR 15KΩ, 1/16W
R24	NRSA63J-472N	RESISTOR 4.7KΩ, 1/16W			
R25	NRSA63J-684N	RESISTOR 680KΩ, 1/16W	R103	NRSA63J-274N	RESISTOR 270KΩ, 1/16W
R26	NRSA63J-223N	RESISTOR 22KΩ, 1/16W	R104	NRSA63J-473N	RESISTOR 47KΩ, 1/16W
R27	NRSA63J-473N	RESISTOR 47KΩ, 1/16W	R105	NRSA63J-102N	RESISTOR 1KΩ, 1/16W
R28	NRSA63J-333N	RESISTOR 33KΩ, 1/16W	R106	NRSA63J-102N	RESISTOR 1KΩ, 1/16W
R29	NRSA63J-333N	RESISTOR 33KΩ, 1/16W	R107	NRSA63J-102N	RESISTOR 1KΩ, 1/16W
R30	NRSA63J-153N	RESISTOR 15KΩ, 1/16W	R108	NRSA63J-102N	RESISTOR 1KΩ, 1/16W
			R109	NRSA63J-223N	RESISTOR 22KΩ, 1/16W
R31	NRSA63J-333N	RESISTOR 33KΩ, 1/16W	R110	PU59237-472	V RESISTOR, BATTERY V DET
R32	NRSA63J-153N	RESISTOR 15KΩ, 1/16W			
R33	NRSA63J-105N	RESISTOR 1MΩ, 1/16W	R111	NRSA63J-822N	RESISTOR 8.2KΩ, 1/16W
R35	NRSA63J-274N	RESISTOR 270KΩ, 1/16W	R112	NRSA63J-102N	RESISTOR 1KΩ, 1/16W
R36	NRSA63J-274N	RESISTOR 270KΩ, 1/16W	R113	NRSA63J-102N	RESISTOR 1KΩ, 1/16W
R39	NRSA63J-102N	RESISTOR 1KΩ, 1/16W	R114	NRSA63J-0R0N	RESISTOR 0Ω, 1/16W
R40	NRSA63J-105N	RESISTOR 1MΩ, 1/16W	R115	NRSA63J-224N	RESISTOR 220KΩ, 1/16W
			R116	NRSA63J-333N	RESISTOR 33KΩ, 1/16W
R41	NRSA63J-102N	RESISTOR 1KΩ, 1/16W	R117	NRSA63J-102N	RESISTOR 1KΩ, 1/16W
R42	NRSA63J-102N	RESISTOR 1KΩ, 1/16W	R118	NRSA63J-102N	RESISTOR 1KΩ, 1/16W
R44	NRSA63J-333N	RESISTOR 33KΩ, 1/16W	R119	NRSA63J-102N	RESISTOR 1KΩ, 1/16W
R45	NRSA63J-103N	RESISTOR 10KΩ, 1/16W	R120	NRSA63J-0R0N	RESISTOR 0Ω, 1/16W
R46	NRSA63J-103N	RESISTOR 10KΩ, 1/16W			
R47	NRSA63J-473N	RESISTOR 47KΩ, 1/16W	R121	NRSA63J-102N	RESISTOR 1KΩ, 1/16W
R48	NRSA63J-154N	RESISTOR 150KΩ, 1/16W	R122	NRSA63J-102N	RESISTOR 1KΩ, 1/16W
R50	NRSA63J-102N	RESISTOR 1KΩ, 1/16W	R123	NRSA63J-333N	RESISTOR 33KΩ, 1/16W
			R124	NRSA63J-102N	RESISTOR 1KΩ, 1/16W
R51	NRSA63J-102N	RESISTOR 1KΩ, 1/16W	R125	NRSA63J-333N	RESISTOR 33KΩ, 1/16W
R52	NRSA63J-104N	RESISTOR 100KΩ, 1/16W	R126	NRSA63J-105N	RESISTOR 1MΩ, 1/16W
R53	NRSA63J-224N	RESISTOR 220KΩ, 1/16W	R127	NRSA63J-224N	RESISTOR 220KΩ, 1/16W
			R128	NRSA63J-224N	RESISTOR 220KΩ, 1/16W
R64	NRSA63J-102N	RESISTOR 1KΩ, 1/16W	R129	NRSA63J-333N	RESISTOR 33KΩ, 1/16W
R65	NRSA63J-103N	RESISTOR 10KΩ, 1/16W	R130	NRSA63J-333N	RESISTOR 33KΩ, 1/16W
R66	NRSA63J-274N	RESISTOR 270KΩ, 1/16W			
R67	NRSA63J-104N	RESISTOR 100KΩ, 1/16W	R131	NRSA63J-333N	RESISTOR 33KΩ, 1/16W
R68	NRSA63J-222N	RESISTOR 2.2KΩ, 1/16W	R133	NRSA63J-473N	RESISTOR 47KΩ, 1/16W
R69	NRSA63J-222N	RESISTOR 2.2KΩ, 1/16W	R134	NRSA63J-473N	RESISTOR 47KΩ, 1/16W
			R135	NRSA63J-562N	RESISTOR 5.6KΩ, 1/16W
R72	NRSA63J-472N	RESISTOR 4.7KΩ, 1/16W	R136	NRSA63J-473N	RESISTOR 47KΩ, 1/16W
R73	NRSA63J-223N	RESISTOR 22KΩ, 1/16W	R137	NRSA63J-333N	RESISTOR 33KΩ, 1/16W

#△ REF No.	PART No.	PART NAME, DESCRIPTION		#△ REF No.	PART No.	PART NAME, DESCRIPTION	
R138	NRSA63J-333N	RESISTOR	33KΩ, 1/16W	R195	NRSA63J-222N	RESISTOR	2.2KΩ, 1/16W
R139	NRSA63J-333N	RESISTOR	33KΩ, 1/16W	R196	NRSA63J-222N	RESISTOR	2.2KΩ, 1/16W
R140	NRSA63J-333N	RESISTOR	33KΩ, 1/16W	R198	NRSA63J-0R0N	RESISTOR	0Ω, 1/16W
				R199	NRSA63J-473N	RESISTOR	47KΩ, 1/16W
R141	NRSA63J-333N	RESISTOR	33KΩ, 1/16W				
R142	NRSA63J-333N	RESISTOR	33KΩ, 1/16W	R208	NRSA63J-333N	RESISTOR	33KΩ, 1/16W
R143	NRSA63J-333N	RESISTOR	33KΩ, 1/16W	R209	NRSA63J-333N	RESISTOR	33KΩ, 1/16W
R144	NRSA63J-333N	RESISTOR	33KΩ, 1/16W	R210	NRSA63J-154N	RESISTOR	150KΩ, 1/16W
R145	NRSA63J-333N	RESISTOR	33KΩ, 1/16W				
R146	NRSA63J-333N	RESISTOR	33KΩ, 1/16W	R211	NRSA63J-154N	RESISTOR	150KΩ, 1/16W
R147	NRSA63J-333N	RESISTOR	33KΩ, 1/16W	R212	NRSA63J-102N	RESISTOR	1KΩ, 1/16W
R148	NRSA63J-333N	RESISTOR	33KΩ, 1/16W	R213	NRSA63J-102N	RESISTOR	1KΩ, 1/16W
R149	NRSA63J-562N	RESISTOR	5.6KΩ, 1/16W	R214	NRSA63J-104N	RESISTOR	100KΩ, 1/16W
R150	NRSA63J-682N	RESISTOR	6.8KΩ, 1/16W	R215	NRSA63J-104N	RESISTOR	100KΩ, 1/16W
				R217	NRSA63J-224N	RESISTOR	220KΩ, 1/16W
R151	NRSA63J-682N	RESISTOR	6.8KΩ, 1/16W	R220	NRSA63J-0R0N	RESISTOR	0Ω, 1/16W
R152	NRSA63J-682N	RESISTOR	6.8KΩ, 1/16W				
R153	NRSA63J-562N	RESISTOR	5.6KΩ, 1/16W	R221	NRSA63J-473N	RESISTOR	47KΩ, 1/16W
R154	NRSA63J-104N	RESISTOR	100KΩ, 1/16W	R222	NRSA63J-103N	RESISTOR	10KΩ, 1/16W
R155	NRSA63J-104N	RESISTOR	100KΩ, 1/16W	R223	NRSA63J-102N	RESISTOR	1KΩ, 1/16W
R156	NRSA63J-104N	RESISTOR	100KΩ, 1/16W	R224	NRSA63J-104N	RESISTOR	100KΩ, 1/16W
R157	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	R227	NRSA63J-0R0N	RESISTOR	0Ω, 1/16W
R158	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	R228	NRSA63J-104N	RESISTOR	100KΩ, 1/16W
R159	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	R230	NRSA63J-103N	RESISTOR	10KΩ, 1/16W
R160	NRSA63J-102N	RESISTOR	1KΩ, 1/16W				
				R401	PU59237-334	V RESISTOR, FRAME SERVO	
R161	NRSA63J-103N	RESISTOR	10KΩ, 1/16W	R402	NRSA63J-184N	RESISTOR	180KΩ, 1/16W
R162	NRSA63J-104N	RESISTOR	100KΩ, 1/16W	R403	NRSA63J-392N	RESISTOR	3.9KΩ, 1/16W
R163	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	R404	NRSA63J-562N	RESISTOR	5.6KΩ, 1/16W
R164	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	R405	NRSA63J-103N	RESISTOR	10KΩ, 1/16W
R165	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	R406	NRSA63J-152N	RESISTOR	1.5KΩ, 1/16W
R166	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	R407	NRSA63J-105N	RESISTOR	1MΩ, 1/16W
R167	NRSA63J-102N	RESISTOR	1KΩ, 1/16W				
R168	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	R501	NRSA63J-103N	RESISTOR	10KΩ, 1/16W
R169	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	R502	NRSA63J-105N	RESISTOR	1MΩ, 1/16W
R170	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	R503	NRSA63J-333N	RESISTOR	33KΩ, 1/16W
R171	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	C1	QERF0JM-107	E CAPACITOR	100μF, 6.3V
R172	NRSA63J-473N	RESISTOR	47KΩ, 1/16W	C2	NCB31EK-103A	CAPACITOR	0.01μF, 25V
R173	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	C3	NCB31EK-103A	CAPACITOR	0.01μF, 25V
R174	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	C4	NCS31HJ-121A	CAPACITOR	120PF, 50V
R175	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	C5	NCS31HJ-121A	CAPACITOR	120PF, 50V
R176	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	C6	PGZ01800-687	E CAPACITOR	-600μF
R177	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	C7	QCYA1HK-222	CAPACITOR	0.0022μF, 50V
R178	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	C8	QER41CM-107	E CAPACITOR	100μF, 16V
R179	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	C9	QCYA1HK-222	CAPACITOR	0.0022μF, 50V
R180	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	C10	QER41CM-107	E CAPACITOR	100μF, 16V
R181	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	C11	QCYA1HK-332	CAPACITOR	0.0033μF, 50V
R182	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	C12	QERF1HM-105	E CAPACITOR	1μF, 50V
R183	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	C13	NCB31EK-103A	CAPACITOR	0.01μF, 25V
R184	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	C14	QERF1CM-106	E CAPACITOR	10μF, 16V
R185	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	C15	NCS31HJ-471A	CAPACITOR	470PF, 50V
R186	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	C16	QERF1CM-106	E CAPACITOR	10μF, 16V
R187	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	C17	QERF1CM-106	E CAPACITOR	10μF, 16V
R188	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	C18	NCB31HK-102A	CAPACITOR	0.001μF, 50V
R189	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	C19	QERF1CM-476	E CAPACITOR	47μF, 16V
R190	NRSA63J-103N	RESISTOR	10KΩ, 1/16W	C20	QERF1HM-105	E CAPACITOR	1μF, 50V
R192	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	C21	NCB31HK-222A	CAPACITOR	0.0022μF, 50V
R193	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	C22	NCB31HK-102A	CAPACITOR	0.001μF, 50V
R194	NRSA63J-102N	RESISTOR	1KΩ, 1/16W				

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#△ REF No.	PART No.	PART NAME, DESCRIPTION	
C23	QERF0JM-226	E CAPACITOR	22μF,6.3V
C24	QEPA1HM-224	NP E CAPACITOR	0.22μF,50V
C25	NCR31CK-153A	CAPACITOR	0.015μF,16V
C26	QEPA1HM-224	NP E CAPACITOR	0.22μF,50V
C27	NCB31HK-332A	CAPACITOR	0.0033μF,50V
C28	QEPA1HM-474	NP E CAPACITOR	0.47μF,50V
C30	QERF0JM-107	E CAPACITOR	100μF,6.3V
C31	NCB31HK-102A	CAPACITOR	0.001μF,50V
C32	NCB31HK-102A	CAPACITOR	0.001μF,50V
C33	QFN41HJ-823	M CAPACITOR	0.082μF,50V
C34	NCB31HK-102A	CAPACITOR	0.001μF,50V
C35	NCB31HK-102A	CAPACITOR	0.001μF,50V
C36	NCB31EK-103A	CAPACITOR	0.01μF,25V
C37	NCB31HK-332A	CAPACITOR	0.0033μF,50V
C38	QCYA1EK-104	CAPACITOR	0.1μF,25V
C40	QCYA1HK-152	CAPACITOR	0.0015μF,50V
C41	QCSA1HJ-330	CAPACITOR	33PF,50V
C42	QCSA1HJ-330	CAPACITOR	33PF,50V
C43	QCSA1HJ-561	CAPACITOR	560PF,50V
C44	QCYA1HK-102	CAPACITOR	0.001μF,50V
C45	QCYA1EK-104	CAPACITOR	0.1μF,25V
C46	QCSA1HJ-330	CAPACITOR	33PF,50V
C47	QCSA1HJ-330	CAPACITOR	33PF,50V
C48	QCYA1EK-104	CAPACITOR	0.1μF,25V
C49	QCYA1EK-104	CAPACITOR	0.1μF,25V
C61	QCYA1EK-104	CAPACITOR	0.1μF,25V
C62	QCSA1HJ-100	CAPACITOR	10PF,50V
C63	QCSA1HJ-100	CAPACITOR	10PF,50V
C64	QERF1HM-105	E CAPACITOR	1μF,50V
C65	QEPA1HM-105	NP E CAPACITOR	1μF,50V
C66	QCYA1HK-103	CAPACITOR	0.01μF,50V
C67	QCYA1HK-103	CAPACITOR	0.01μF,50V
C68	QCYA1EK-104	CAPACITOR	0.1μF,25V
C69	NCB31CK-333A	CAPACITOR	0.033μF,16V
C70	QEA40HZ-224	E CAPACITOR (DOUBLE)	0.22F,5.5V
C71	NEE21EM-105RY	TANTAL CAPACITOR	1μF,25V
C72	NEE21EM-105RY	TANTAL CAPACITOR	1μF,25V
C73	QERF0JM-107	E CAPACITOR	100μF,6.3V
C74	NCF31CZ-104A	CAPACITOR	0.1μF,16V
C75	NCB31CK-223A	CAPACITOR	0.022μF,16V
C76	NCB31CK-223A	CAPACITOR	0.022μF,16V
C77	NCB31CK-223A	CAPACITOR	0.022μF,16V
C401	NFV31CJ-104AY	TF CAPACITOR	0.1μF,16V
C402	NCB31CK-333A	CAPACITOR	0.033μF,16V
C404	NCB31EK-153A	CAPACITOR	0.015μF,25V
C501	NEE21AM-475RY	TANTAL CAPACITOR	4.7μF,10V
C502	NEE21AM-475RY	TANTAL CAPACITOR	4.7μF,10V
L1	PU56181-151	COIL	150μH
△ CF1	PU55407	RESONATOR	
△ X1	PGZ00857	CRYSTAL RESONATOR	

#△ REF No.	PART No.	PART NAME, DESCRIPTION
△ X2	PGZ01577	CRYSTAL RESONATOR
K1	PGZ00354	FERRITE BEADS
△ TH1	PU52108-2R2	POSITIVE THERMISTOR
T1	YU41190	TRANS
T2	YU41190	TRANS
BKT1	PRD43842	BRACKET, X2
SCW1	PRD30093	SCREW, X2
SLD1	PRS40029	SHIELD PLATE
SLD2	PRS40025	SHIELD CASE
SLD3	PU61042	SHIELD COVER
SLD4	PU61043	SHIELD PLATE
TP1	PGZ01015	TEST PIN, X13(TP1-6,8-14)
TP7	PU56008	TEST-PIN
CN1	PGZ01519-100	CONNECTOR

REGULATOR BOARD ASSEMBLY <06>		
PWBA	PRK20163B-03	REGULATOR BOARD ASSY
△ STK1	PRD30072-72	STICKER, X2
△ STK2	PRD30072-73	STICKER
△ STK3	PRD30072-74	STICKER
IC1	MB3782PF	IC
IC2	M5237ML	IC
IC3	S-81252HG	IC
Q1	2SB1019(Y)	TRANSISTOR
Q2	2SJ146	FE TRANSISTOR
Q3	2SB1073(PQ)-XE	TRANSISTOR
Q4	2SB1073(PQ)-XE	TRANSISTOR
Q5	2SB1073(PQ)-XE	TRANSISTOR
Q6	2SB1132(QR)	TRANSISTOR
Q7	DTC124EU	TRANSISTOR
D2	ERA82-004	DIODE
D3	ERA82-004	DIODE

#△ REF No.	PART No.	PART NAME, DESCRIPTION		#△ REF No.	PART No.	PART NAME, DESCRIPTION	
D4	ERA82-004	DIODE		C17	QFN41HJ-102	M CAPACITOR	0.001μF,50V
D5	1SS133	DIODE		C18	QCYA1HK-822	CAPACITOR	0.0082μF,50V
D6	RD2.0EB1	ZENER DIODE		C19	QCYA1HK-102	CAPACITOR	0.001μF,50V
R1	QRSA08J-221YN	RESISTOR	220Ω,1/10W	C21	QCYA1HK-152	CAPACITOR	0.0015μF,50V
R2	QRSA08J-105YN	RESISTOR	1MΩ,1/10W	C22	QEZ0105-276	E CAPACITOR	27μF
R3	QRSA08J-824YN	RESISTOR	820KΩ,1/10W	C23	PU57601-156MC	E CAPACITOR	15μF
R4	QRSA08J-123YN	RESISTOR	12KΩ,1/10W	C24	QCYA1HK-102	CAPACITOR	0.001μF,50V
R5	QRSA08J-123YN	RESISTOR	12KΩ,1/10W	C27	QEZ0105-276	E CAPACITOR	27μF
R6	NVP1301-102N	V RESISTOR	1KΩ	C28	QEK40JM-227	E CAPACITOR	220μF,6.3V
R7	QRSA08J-152YN	RESISTOR	1.5KΩ,1/10W	C29	PU57601-156MC	E CAPACITOR	15μF
R8	QRSA08J-221YN	RESISTOR	220Ω,1/10W	L2	PU56181-470	COIL	47μH
R9	QRSA08J-154YN	RESISTOR	150KΩ,1/10W	L3	YU40601-13	COIL	
R10	QRSA08J-154YN	RESISTOR	150KΩ,1/10W	L4	YU40601-13	COIL	
R11	QRSA08J-473YN	RESISTOR	47KΩ,1/10W	L5	PU56181-470	COIL	47μH
R12	QRSA08J-473YN	RESISTOR	47KΩ,1/10W	L6	PU56181-470	COIL	47μH
R13	QRSA08J-822YN	RESISTOR	8.2KΩ,1/10W	L7	PU56181-470	COIL	47μH
R14	NVP1301-472N	V RESISTOR	4.7KΩ	T1	YU41235	TRANS	
R15	QRSA08J-154YN	RESISTOR	150KΩ,1/10W	T2	YU41190	TRANS	
R16	QRSA08J-102YN	RESISTOR	1KΩ,1/10W	T3	YU41235	TRANS	
R17	QRSA08J-682YN	RESISTOR	6.8KΩ,1/10W	BKT1	PRD43842	BRACKET	
R18	NVP1301-103N	V RESISTOR	10KΩ	CL1	YU40245-05	WIRE CLAMP	
R19	QRSA08J-681YN	RESISTOR	680Ω,1/10W	△ HS1	PRD44040	HEAT SINK	
R20	QRSA08J-822YN	RESISTOR	8.2KΩ,1/10W	SCW1	SPSP3006Z	SCREW	
R21	QRSA08J-102YN	RESISTOR	1KΩ,1/10W	SCW2	SDST2606Z	SCREW	
R22	QRSA08J-183YN	RESISTOR	18KΩ,1/10W	SLD1	PU61050	SHIELD COVER	
R23	QRSA08J-681YN	RESISTOR	680Ω,1/10W	SLD2	PRS40024	SHIELD CASE	
R24	QRSA08J-682YN	RESISTOR	6.8KΩ,1/10W	SLD3	PU61051	SHIELD PLATE	
R25	NVP1301-103N	V RESISTOR	10KΩ	TP1	PU56008	TEST-PIN, X2(TP1,2)	
R26	QRSA08J-682YN	RESISTOR	6.8KΩ,1/10W	TP3	PGZ01015	TEST PIN, X4(TP3-6)	
R27	QRSA08J-681YN	RESISTOR	680Ω,1/10W	CN1	PGZ01519-032	CONNECTOR	
R28	QRSA08J-822YN	RESISTOR	8.2KΩ,1/10W	△ CP1	ICP-F20	CIRCUIT PROTECTOR	
R29	NVP1301-103N	V RESISTOR	10KΩ	△ CP2	ICP-F25	CIRCUIT PROTECTOR	
R30	QRSA08J-472YN	RESISTOR	4.7KΩ,1/10W	△ CP3	ICP-F20	CIRCUIT PROTECTOR	
R31	QRSA08J-102YN	RESISTOR	1KΩ,1/10W	△ CP4	ICP-F20	CIRCUIT PROTECTOR	
R32	QRSA08J-102YN	RESISTOR	1KΩ,1/10W	△ CP5	ICP-F25	CIRCUIT PROTECTOR	
R33	NRVA62D-392N	RESISTOR	3.9KΩ,1/16W				
R34	NRVA62D-113N	RESISTOR	11KΩ,1/16W				
R35	QRSA08J-331YN	RESISTOR	330Ω,1/10W				
R36	QRSA08J-331YN	RESISTOR	330Ω,1/10W				
R37	QRSA08J-331YN	RESISTOR	330Ω,1/10W				
R38	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W				
C1	QETA1EM-337	E CAPACITOR	330μF,25V				
C2	QCFA1HZ-473	CAPACITOR	0.047μF,50V				
C4	QEK41CM-107	E CAPACITOR	100μF,16V				
C5	QER41EM-106	E CAPACITOR	10μF,25V				
C6	QER41EM-106	E CAPACITOR	10μF,25V				
C8	QCYA1HK-102	CAPACITOR	0.001μF,50V				
C9	QCYA1HK-152	CAPACITOR	0.0015μF,50V				
C10	QEZ0105-276	E CAPACITOR	27μF				
C11	PU57601-156MC	E CAPACITOR	15μF				
C12	PU57601-156MC	E CAPACITOR	15μF				
C13	QCYA1HK-822	CAPACITOR	0.0082μF,50V				
C15	QCYA1HK-822	CAPACITOR	0.0082μF,50V				
C16	QCYA1HK-103	CAPACITOR	0.01μF,50V				

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#△ REF No.	PART No.	PART NAME, DESCRIPTION

AUDIO BOARD ASSEMBLY <07>

PWBA	PRK10109C-04	AUDIO BOARD ASSY
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IC1	NJM2068MD	IC
IC2	NJM2068MD	IC
IC3	M5201FP	IC
IC4	M5201FP	IC
IC5	NJM2068MD	IC
IC6	NJM2068MD	IC
IC7	NJM4556MB	IC
IC8	NJM2068MD	IC
IC9	NJM386M	IC
IC10	M5201FP	IC
IC11	M5201FP	IC
IC12	TK15021	IC
IC13	NJM2068MD	IC
IC15	JCP0038	IC
IC16	LA7285M(L1)	IC
IC17	LA7285M(L1)	IC
IC18	CXA1102M	IC
IC19	TC4094BF	IC
Q1	2SK208(O)	FE TRANSISTOR
Q2	2SK208(O)	FE TRANSISTOR
Q5	FMW3	TRANSISTOR
Q6	FMW3	TRANSISTOR
Q7	DTA114EU	TRANSISTOR
Q8	2SA1576(QRS)	TRANSISTOR
Q9	2SA1576(QRS)	TRANSISTOR
Q10	2SC4081(QRS)	TRANSISTOR
Q11	2SC4081(QRS)	TRANSISTOR
Q13	DTC124EU	TRANSISTOR
Q14	DTC124EU	TRANSISTOR
Q15	DTC124EU	TRANSISTOR
Q16	DTC124EU	TRANSISTOR
Q17	2SC4081(QRS)	TRANSISTOR
Q18	DTA114EU	TRANSISTOR
Q19	DTA114EU	TRANSISTOR
Q20	2SC4081(QRS)	TRANSISTOR
Q21	2SC4081(QRS)	TRANSISTOR
Q22	FMS3	TRANSISTOR
Q23	FMW3	TRANSISTOR
Q24	FMW3	TRANSISTOR
Q25	DTA114EU	TRANSISTOR
Q26	DTA114EU	TRANSISTOR
Q27	DTC124TU	TRANSISTOR
Q28	DTC144EU	TRANSISTOR
Q29	DTC144EU	TRANSISTOR
Q30	DTC124EU	TRANSISTOR
Q31	DTA114EU	TRANSISTOR
Q32	DTA114EU	TRANSISTOR
Q33	DTA114EU	TRANSISTOR
Q34	DTC124EU	TRANSISTOR

#△ REF No.	PART No.	PART NAME, DESCRIPTION
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Q35	DTA114EU	TRANSISTOR
Q36	DTC124EU	TRANSISTOR
Q37	2SC4081(QRS)	TRANSISTOR
Q38	DTA114EU	TRANSISTOR
Q39	FMW3	TRANSISTOR
Q40	FMW3	TRANSISTOR
Q41	DTA114EU	TRANSISTOR
Q42	DTA114EU	TRANSISTOR
Q43	DTA114EU	TRANSISTOR
Q44	DTC124EU	TRANSISTOR
Q46	DTC124EU	TRANSISTOR
Q47	DTA124EU	TRANSISTOR
Q48	2SD601A	TRANSISTOR
Q49	DTA124EU	TRANSISTOR
Q50	DTC124EU	TRANSISTOR
Q51	2SC4081(QRS)	TRANSISTOR
Q52	DTC124EU	TRANSISTOR
Q53	DTA124EU	TRANSISTOR

D1	DA204U	DIODE
D2	DA204U	DIODE
D3	DA204U	DIODE
D4	DA204U	DIODE
D5	DA204U	DIODE
D6	DA204U	DIODE
D7	DA204U	DIODE
D8	DA204U	DIODE
D9	DAN202U	DIODE
D10	DA204U	DIODE
D11	DA204U	DIODE
D12	DA204U	DIODE
D13	DA204U	DIODE
D14	DAP202U	DIODE

R1	NRSA63J-223N	RESISTOR	22KΩ, 1/16W
R2	NRSA63J-223N	RESISTOR	22KΩ, 1/16W
R3	NRSA63J-223N	RESISTOR	22KΩ, 1/16W
R4	NRSA63J-223N	RESISTOR	22KΩ, 1/16W
R5	NRSA63J-682N	RESISTOR	6.8KΩ, 1/16W
R6	NRSA63J-682N	RESISTOR	6.8KΩ, 1/16W
R7	NRSA63J-682N	RESISTOR	6.8KΩ, 1/16W
R8	NRSA63J-682N	RESISTOR	6.8KΩ, 1/16W
R9	NRSA63J-103N	RESISTOR	10KΩ, 1/16W
R10	NRSA63J-103N	RESISTOR	10KΩ, 1/16W
R11	NRSA63J-222N	RESISTOR	2.2KΩ, 1/16W
R12	NRSA63J-473N	RESISTOR	47KΩ, 1/16W
R13	NRSA63J-473N	RESISTOR	47KΩ, 1/16W
R14	NRSA63J-224N	RESISTOR	220KΩ, 1/16W
R15	NRSA63J-222N	RESISTOR	2.2KΩ, 1/16W
R16	NRSA63J-473N	RESISTOR	47KΩ, 1/16W
R17	NRSA63J-473N	RESISTOR	47KΩ, 1/16W
R18	NRSA63J-224N	RESISTOR	220KΩ, 1/16W
R19	NRSA63J-391N	RESISTOR	390Ω, 1/16W
R20	NRSA63J-185N	RESISTOR	1.8MΩ, 1/16W

#△ REF No.	PART No.	PART NAME, DESCRIPTION		#△ REF No.	PART No.	PART NAME, DESCRIPTION	
R21	NRSA63J-391N	RESISTOR	390Ω,1/16W	R81	NRVA63D-472N	RESISTOR	4.7KΩ,1/16W
R22	NRSA63J-185N	RESISTOR	1.8MΩ,1/16W	R82	NRSA63J-181N	RESISTOR	180Ω,1/16W
R23	NRSA63J-105N	RESISTOR	1MΩ,1/16W	R83	NRVA63D-472N	RESISTOR	4.7KΩ,1/16W
R24	NRSA63J-105N	RESISTOR	1MΩ,1/16W	R84	NRSA63J-472N	RESISTOR	4.7KΩ,1/16W
R25	NRSA63J-104N	RESISTOR	100KΩ,1/16W	R85	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R26	NRSA63J-105N	RESISTOR	1MΩ,1/16W	R86	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R27	NRSA63J-105N	RESISTOR	1MΩ,1/16W	R87	NRSA63J-473N	RESISTOR	47KΩ,1/16W
R28	NRSA63J-104N	RESISTOR	100KΩ,1/16W	R88	NRSA63J-473N	RESISTOR	47KΩ,1/16W
R29	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R89	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R30	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R90	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R31	NRSA63J-560N	RESISTOR	56Ω,1/16W	R91	NRSA63J-331N	RESISTOR	330Ω,1/16W
R32	NRSA63J-560N	RESISTOR	56Ω,1/16W	R92	NRSA63J-334N	RESISTOR	330KΩ,1/16W
R33	NRSA63J-822N	RESISTOR	8.2KΩ,1/16W	R93	NRVA63D-152N	RESISTOR	1.5KΩ,1/16W
R34	NRSA63J-562N	RESISTOR	5.6KΩ,1/16W	R94	NRSA63J-154N	RESISTOR	150KΩ,1/16W
R35	NRSA63J-333N	RESISTOR	33KΩ,1/16W	R95	NRVA63D-152N	RESISTOR	1.5KΩ,1/16W
R36	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R96	NRVA63D-153N	RESISTOR	15KΩ,1/16W
R37	NRSA63J-333N	RESISTOR	33KΩ,1/16W	R97	NRVA63D-153N	RESISTOR	15KΩ,1/16W
R38	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R98	NRVA63D-153N	RESISTOR	15KΩ,1/16W
R39	PGZ01538	V RESISTOR, REC LEVLE(L)		R99	NRVA63D-153N	RESISTOR	15KΩ,1/16W
R40	PGZ01538	V RESISTOR, REC LEVEL(R)		R101	NRSA63J-0R0N	RESISTOR	0Ω,1/16W
R41	NRSA63J-473N	RESISTOR	47KΩ,1/16W	R102	NRSA63J-151N	RESISTOR	150Ω,1/16W
R42	NRSA63J-473N	RESISTOR	47KΩ,1/16W	R103	NRSA63J-470N	RESISTOR	47Ω,1/16W
R43	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R104	NRSA63J-151N	RESISTOR	150Ω,1/16W
R44	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R105	NRSA63J-470N	RESISTOR	47Ω,1/16W
R45	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R108	NRSA63J-0R0N	RESISTOR	0Ω,1/16W
R46	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R109	NRSA63J-0R0N	RESISTOR	0Ω,1/16W
R47	NRSA63J-223N	RESISTOR	22KΩ,1/16W	R111	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R48	NRSA63J-223N	RESISTOR	22KΩ,1/16W	R112	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R49	NRSA63J-473N	RESISTOR	47KΩ,1/16W	R113	NRSA63J-473N	RESISTOR	47KΩ,1/16W
R50	NRSA63J-473N	RESISTOR	47KΩ,1/16W	R114	NRSA63J-473N	RESISTOR	47KΩ,1/16W
R51	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R115	NRSA63J-473N	RESISTOR	47KΩ,1/16W
R52	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R116	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R53	NRSA63J-223N	RESISTOR	22KΩ,1/16W	R117	PGZ01537	V RESISTOR, MONITOR LEVEL	
R54	NRSA63J-223N	RESISTOR	22KΩ,1/16W	R118	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R55	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R119	NRSA63J-105N	RESISTOR	1MΩ,1/16W
R56	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R120	NVP1415-102N	V RESISTOR, ARARM LEVEL	1KΩ,1/4W
R57	NRSA63J-473N	RESISTOR	47KΩ,1/16W	R121	NRSA63J-682N	RESISTOR	6.8KΩ,1/16W
R61	NRVA63D-472N	RESISTOR	4.7KΩ,1/16W	R123	NRSA63J-100N	RESISTOR	10Ω,1/16W
R62	NRSA63J-181N	RESISTOR	180Ω,1/16W	R124	NRSA63J-332N	RESISTOR	3.3KΩ,1/16W
R63	NRVA63D-472N	RESISTOR	4.7KΩ,1/16W	R125	NRSA63J-104N	RESISTOR	100KΩ,1/16W
R64	NRSA63J-472N	RESISTOR	4.7KΩ,1/16W	R126	NRSA63J-100N	RESISTOR	10Ω,1/16W
R65	NRSA63J-223N	RESISTOR	22KΩ,1/16W	R127	NRSA63J-473N	RESISTOR	47KΩ,1/16W
R66	NRSA63J-223N	RESISTOR	22KΩ,1/16W	R128	NVP1415-204N	VR, SAVE-1 LCH EE LEV (GY-X2)	
R67	NRSA63J-473N	RESISTOR	47KΩ,1/16W	R129	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R68	NRSA63J-473N	RESISTOR	47KΩ,1/16W	R130	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R69	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R131	NRSA63J-0R0N	RESISTOR	0Ω,1/16W
R70	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R133	NRSA63J-473N	RESISTOR	47KΩ,1/16W
R71	NRSA63J-331N	RESISTOR	330Ω,1/16W	R134	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R72	NRSA63J-334N	RESISTOR	330KΩ,1/16W	R135	NRSA63J-473N	RESISTOR	47KΩ,1/16W
R73	NRVA63D-152N	RESISTOR	1.5KΩ,1/16W	R136	NRSA63J-473N	RESISTOR	47KΩ,1/16W
R74	NRSA63J-154N	RESISTOR	150KΩ,1/16W	R137	NRSA63J-473N	RESISTOR	47KΩ,1/16W
R75	NRVA63D-152N	RESISTOR	1.5KΩ,1/16W	R138	NVP1415-204N	VR, SAVE-1 RCH EE LEV (GY-X2)	
R76	NRVA63D-153N	RESISTOR	15KΩ,1/16W	R139	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R77	NRVA63D-153N	RESISTOR	15KΩ,1/16W	R140	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R78	NRVA63D-153N	RESISTOR	15KΩ,1/16W	R141	NRSA63J-0R0N	RESISTOR	0Ω,1/16W
R79	NRVA63D-153N	RESISTOR	15KΩ,1/16W	R143	NRSA63J-473N	RESISTOR	47KΩ,1/16W

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#△ REF No.	PART No.	PART NAME, DESCRIPTION		#△ REF No.	PART No.	PART NAME, DESCRIPTION
R144	NRSA63J-103N	RESISTOR	10KΩ, 1/16W	R205	NVP1415-503N	V RESISTOR, FMA PB LEVEL(R) 50KΩ, 1/4W
R145	NRSA63J-103N	RESISTOR	10KΩ, 1/16W	R206	NRSA63J-0R0N	RESISTOR 0Ω, 1/16W
R146	NRSA63J-103N	RESISTOR	10KΩ, 1/16W	R208	NRSA63J-101N	RESISTOR 100Ω, 1/16W
R147	NRSA63J-122N	RESISTOR	1.2KΩ, 1/16W	R209	NRSA63J-153N	RESISTOR 15KΩ, 1/16W
R148	NRSA63J-122N	RESISTOR	1.2KΩ, 1/16W	R210	NRSA63J-562N	RESISTOR 5.6KΩ, 1/16W
R149	NRSA63J-102N	RESISTOR	1KΩ, 1/16W			
R150	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	R211	NVP1415-502N	V RESISTOR, FMA CARRIER(R) 5KΩ, 1/4W
				R212	NRSA63J-103N	RESISTOR 10KΩ, 1/16W
R151	NRSA63J-472N	RESISTOR	4.7KΩ, 1/16W	R213	NRSA63J-182N	RESISTOR 1.8KΩ, 1/16W
R152	NVP1415-103N	V RESISTOR, LEVEL METER(L)	10KΩ, 1/4W	R214	NRSA63J-562N	RESISTOR 5.6KΩ, 1/16W
R153	NRSA63J-472N	RESISTOR	4.7KΩ, 1/16W	R215	NRSA63J-272N	RESISTOR 2.7KΩ, 1/16W
R154	NVP1415-103N	V RESISTOR, LEVEL METER(R)	10KΩ, 1/4W	R216	NRSA63J-272N	RESISTOR 2.7KΩ, 1/16W
R155	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	R217	NRSA63J-103N	RESISTOR 10KΩ, 1/16W
R156	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	R218	NRSA63J-103N	RESISTOR 10KΩ, 1/16W
R157	NRSA63J-104N	RESISTOR	100KΩ, 1/16W	R219	NRSA63J-103N	RESISTOR 10KΩ, 1/16W
R158	NRSA63J-104N	RESISTOR	100KΩ, 1/16W			
R159	NRSA63J-122N	RESISTOR	1.2KΩ, 1/16W	R221	NRSA63J-0R0N	RESISTOR 0Ω, 1/16W
R160	NRSA63J-122N	RESISTOR	1.2KΩ, 1/16W	R222	NRSA63J-303N	RESISTOR 30KΩ, 1/16W
				R223	NRSA63J-183N	RESISTOR 18KΩ, 1/16W
R161	NRSA63J-104N	RESISTOR	100KΩ, 1/16W	R224	NRSA63J-103N	RESISTOR 10KΩ, 1/16W
R162	NRSA63J-104N	RESISTOR	100KΩ, 1/16W	R225	NRSA63J-104N	RESISTOR 100KΩ, 1/16W
R163	NRSA63J-821N	RESISTOR	820Ω, 1/16W	R226	NRSA63J-0R0N	RESISTOR 0Ω, 1/16W
R164	NRSA63J-122N	RESISTOR	1.2KΩ, 1/16W	R227	NRSA63J-511N	RESISTOR 510Ω, 1/16W
R165	NRSA63J-331N	RESISTOR	330Ω, 1/16W	R228	NRSA63J-472N	RESISTOR 4.7KΩ, 1/16W
R166	NRSA63J-223N	RESISTOR	22KΩ, 1/16W	R229	NRSA63J-513N	RESISTOR 51KΩ, 1/16W
R167	NRSA63J-473N	RESISTOR	47KΩ, 1/16W	R230	NVP1415-503N	V RESISTOR, FMA PB LEVEL(L) 50KΩ, 1/4W
R170	PGZ01809	V RESISTOR, TRACKING VR				
				R231	NRSA63J-0R0N	RESISTOR 0Ω, 1/16W
R171	NRSA63J-473N	RESISTOR	47KΩ, 1/16W	R233	NRSA63J-101N	RESISTOR 100Ω, 1/16W
R172	NRSA63J-683N	RESISTOR	68KΩ, 1/16W	R234	NRSA63J-153N	RESISTOR 15KΩ, 1/16W
R173	NRSA63J-473N	RESISTOR	47KΩ, 1/16W	R235	NRSA63J-562N	RESISTOR 5.6KΩ, 1/16W
R174	NRSA63J-683N	RESISTOR	68KΩ, 1/16W	R236	NRSA63J-153N	RESISTOR 15KΩ, 1/16W
R177	NRSA63J-103N	RESISTOR	10KΩ, 1/16W	R237	NVP1415-103N	V RESISTOR, FMA CARRIER(L) 10KΩ, 1/4W
R178	NRSA63J-103N	RESISTOR	10KΩ, 1/16W	R238	NRSA63J-103N	RESISTOR 10KΩ, 1/16W
R179	NRSA63J-103N	RESISTOR	10KΩ, 1/16W	R239	NRSA63J-332N	RESISTOR 3.3KΩ, 1/16W
R180	NRSA63J-103N	RESISTOR	10KΩ, 1/16W			
				R241	NRSA63J-222N	RESISTOR 2.2KΩ, 1/16W
R181	NRSA63J-103N	RESISTOR	10KΩ, 1/16W	R242	NRSA63J-472N	RESISTOR 4.7KΩ, 1/16W
R182	NRSA63J-103N	RESISTOR	10KΩ, 1/16W	R243	NRSA63J-222N	RESISTOR 2.2KΩ, 1/16W
R183	NRSA63J-223N	RESISTOR	22KΩ, 1/16W	R244	NRSA63J-472N	RESISTOR 4.7KΩ, 1/16W
R184	NRSA63J-223N	RESISTOR	22KΩ, 1/16W	R245	NRSA63J-562N	RESISTOR 5.6KΩ, 1/16W
R185	NRSA63J-391N	RESISTOR	390Ω, 1/16W	R246	NRSA63J-682N	RESISTOR 6.8KΩ, 1/16W
R186	NRSA63J-391N	RESISTOR	390Ω, 1/16W	R247	NRSA63J-562N	RESISTOR 5.6KΩ, 1/16W
R187	NRSA63J-822N	RESISTOR	8.2KΩ, 1/16W	R248	NRSA63J-472N	RESISTOR 4.7KΩ, 1/16W
R188	NRSA63J-822N	RESISTOR	8.2KΩ, 1/16W			
R189	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	R251	NRSA63J-222N	RESISTOR 2.2KΩ, 1/16W
R190	NRSA63J-103N	RESISTOR	10KΩ, 1/16W	R252	NRSA63J-560N	RESISTOR 56Ω, 1/16W
				R253	NRSA63J-333N	RESISTOR 33KΩ, 1/16W
R191	NRSA63J-101N	RESISTOR	100Ω, 1/16W	R254	NVP1415-203N	V RESISTOR, N.AUD REC LEV(L) 20KΩ, 1/4W
R192	NRSA63J-102N	RESISTOR	1KΩ, 1/16W	R255	NRSA63J-333N	RESISTOR 33KΩ, 1/16W
R193	NRSA63J-474N	RESISTOR	470KΩ, 1/16W	R256	NRSA63J-103N	RESISTOR 10KΩ, 1/16W
R194	NRSA63J-104N	RESISTOR	100KΩ, 1/16W	R257	NRSA63J-102N	RESISTOR 1KΩ, 1/16W
R195	NRSA63J-104N	RESISTOR	100KΩ, 1/16W	R258	NRSA63J-473N	RESISTOR 47KΩ, 1/16W
R196	NRSA63J-103N	RESISTOR	10KΩ, 1/16W	R259	NRSA63J-153N	RESISTOR 15KΩ, 1/16W
R197	NRSA63J-104N	RESISTOR	100KΩ, 1/16W	R260	NRSA63J-332N	RESISTOR 3.3KΩ, 1/16W
R198	NRSA63J-104N	RESISTOR	100KΩ, 1/16W			
R199	NRSA63J-103N	RESISTOR	10KΩ, 1/16W	R261	NRSA63J-332N	RESISTOR 3.3KΩ, 1/16W
				R262	NRSA63J-153N	RESISTOR 15KΩ, 1/16W
R201	NRSA63J-0R0N	RESISTOR	0Ω, 1/16W	R263	NRSA63J-393N	RESISTOR 39KΩ, 1/16W
R202	NRSA63J-511N	RESISTOR	510Ω, 1/16W	R264	NRSA63J-101N	RESISTOR 100Ω, 1/16W
R203	NRSA63J-472N	RESISTOR	4.7KΩ, 1/16W	R265	NVP1415-102N	V RESISTOR, N.AUD FREQ(L) 1KΩ, 1/4W
R204	NRSA63J-513N	RESISTOR	51KΩ, 1/16W	R266	NRSA63J-334N	RESISTOR 330KΩ, 1/16W

#△ REF No.	PART No.	PART NAME, DESCRIPTION		#△ REF No.	PART No.	PART NAME, DESCRIPTION	
R267	NRSA63J-123N	RESISTOR	12KΩ,1/16W	R329	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R268	NRSA63J-820N	RESISTOR	82Ω,1/16W	R330	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R269	NRSA63J-182N	RESISTOR	1.8KΩ,1/16W				
R271	NVP1415-103N	V RESISTOR, N.AUD PB LEV(L)	10KΩ,1/4W	R331	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R272	NRSA63J-562N	RESISTOR	5.6KΩ,1/16W	R332	NVP1415-203N	V RESISTOR, S-VHS R/P FREQ(L)	20KΩ,1/4W
R273	NRSA63J-184N	RESISTOR	180KΩ,1/16W	R333	NVP1415-203N	V RESISTOR, S-VHS R/P FREQ(R)	20KΩ,1/4W
R274	NRSA63J-224N	RESISTOR	220KΩ,1/16W	R334	NVP1415-503N	V RESISTOR, VHS R/P FREQ(L)	50KΩ,1/4W
R275	NRSA63J-100N	RESISTOR	10Ω,1/16W	R335	NVP1415-503N	V RESISTOR, VHS R/P FREQ(R)	50KΩ,1/4W
R276	NRSA63J-223N	RESISTOR	22KΩ,1/16W	R336	NRSA63J-182N	RESISTOR	1.8KΩ,1/16W
R277	NVP1415-203N	V RESISTOR, N.AUD EE LEV(L)	20KΩ,1/4W	R337	NRSA63J-182N	RESISTOR	1.8KΩ,1/16W
R278	NRSA63J-332N	RESISTOR	3.3KΩ,1/16W	R338	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R279	NRSA63J-154N	RESISTOR	150KΩ,1/16W	R339	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R281	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W	R341	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R282	NRSA63J-560N	RESISTOR	56Ω,1/16W	R342	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R283	NRSA63J-333N	RESISTOR	33KΩ,1/16W	R343	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R284	NVP1415-203N	V RESISTOR, N.AUD REC LEV(R)	20KΩ,1/4W	R344	NRSA63J-123N	RESISTOR	12KΩ,1/16W
R285	NRSA63J-333N	RESISTOR	33KΩ,1/16W	R345	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R286	NRSA63J-103N	RESISTOR	10KΩ,1/16W	R346	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R287	NRSA63J-102N	RESISTOR	1KΩ,1/16W	R347	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R288	NRSA63J-473N	RESISTOR	47KΩ,1/16W	R349	NRSA63J-0R0N	RESISTOR	0Ω,1/16W
R289	NRSA63J-153N	RESISTOR	15KΩ,1/16W	R355	NRSA63J-0R0N	RESISTOR	0Ω,1/16W
R290	NRSA63J-332N	RESISTOR	3.3KΩ,1/16W	R356	NRSA63J-0R0N	RESISTOR	0Ω,1/16W
				R357	NRSA63J-0R0N	RESISTOR	0Ω,1/16W
R291	NRSA63J-332N	RESISTOR	3.3KΩ,1/16W	C1	NEE20JM-475RY	TANTAL CAPACITOR	4.7μF,6.3V
R292	NRSA63J-153N	RESISTOR	15KΩ,1/16W	C2	NEE20JM-475RY	TANTAL CAPACITOR	4.7μF,6.3V
R293	NRSA63J-393N	RESISTOR	39KΩ,1/16W	C3	NEE20JM-475RY	TANTAL CAPACITOR	4.7μF,6.3V
R294	NRSA63J-101N	RESISTOR	100Ω,1/16W	C4	NEE20JM-475RY	TANTAL CAPACITOR	4.7μF,6.3V
R295	NVP1415-102N	V RESISTOR, N.AUD FREQ(R)	1KΩ,1/4W	C5	NCS31HJ-100A	CAPACITOR	10PF,50V
R296	NRSA63J-334N	RESISTOR	330KΩ,1/16W	C6	NCS31HJ-100A	CAPACITOR	10PF,50V
R297	NRSA63J-123N	RESISTOR	12KΩ,1/16W	C7	NCS31HJ-100A	CAPACITOR	10PF,50V
R298	NRSA63J-820N	RESISTOR	82Ω,1/16W	C8	NCS31HJ-100A	CAPACITOR	10PF,50V
R299	NRSA63J-182N	RESISTOR	1.8KΩ,1/16W	C9	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V
R301	NVP1415-103N	V RESISTOR, N.AUD PB LEV(R)	10KΩ,1/4W	C10	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V
R302	NRSA63J-562N	RESISTOR	5.6KΩ,1/16W	C11	NEH10JM-476NP	E CAPACITOR	47μF,6.3V
R303	NRSA63J-184N	RESISTOR	180KΩ,1/16W	C12	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V
R304	NRSA63J-224N	RESISTOR	220KΩ,1/16W	C13	NEH10JM-226N	E CAPACITOR	22μF,6.3V
R305	NRSA63J-100N	RESISTOR	10Ω,1/16W	C14	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V
R306	NRSA63J-223N	RESISTOR	22KΩ,1/16W	C15	NEH10JM-226N	E CAPACITOR	22μF,6.3V
R307	NVP1415-203N	V RESISTOR, N.AUD EE LEV(R)	20KΩ,1/4W	C16	NEH11HM-225NZ	E CAPACITOR	2.2μF,50V
R308	NRSA63J-332N	RESISTOR	3.3KΩ,1/16W	C17	NEH11HM-225NZ	E CAPACITOR	2.2μF,50V
R309	NRSA63J-154N	RESISTOR	150KΩ,1/16W	C18	NEH10JM-476NP	E CAPACITOR	47μF,6.3V
R311	NRSA63J-391N	RESISTOR	390Ω,1/16W	C19	NEH10JM-476NP	E CAPACITOR	47μF,6.3V
R312	NRSA63J-182N	RESISTOR	1.8KΩ,1/16W	C20	NEH10JM-476NP	E CAPACITOR	47μF,6.3V
R313	NRVA63D-433N	RESISTOR	43KΩ,1/16W	C21	NEH10JM-476NP	E CAPACITOR	47μF,6.3V
R314	NRSA63J-391N	RESISTOR	390Ω,1/16W	C22	NCB31HK-102A	CAPACITOR	0.001μF,50V
R315	NRSA63J-182N	RESISTOR	1.8KΩ,1/16W	C23	NCB31HK-102A	CAPACITOR	0.001μF,50V
R316	NRSA63J-473N	RESISTOR	47KΩ,1/16W	C24	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V
R317	NRSA63J-222N	RESISTOR	2.2KΩ,1/16W	C25	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V
R318	NRSA63J-102N	RESISTOR	1KΩ,1/16W	C26	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V
R321	NRSA63J-333N	RESISTOR	33KΩ,1/16W	C27	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V
R322	NRSA63J-682N	RESISTOR	6.8KΩ,1/16W	C28	NEH10JM-476NP	E CAPACITOR	47μF,6.3V
R323	NRSA63J-4R7N	RESISTOR	4.7Ω,1/16W	C29	NEH10JM-476NP	E CAPACITOR	47μF,6.3V
R324	NRSA63J-123N	RESISTOR	12KΩ,1/16W	C30	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V
R325	NRSA63J-103N	RESISTOR	10KΩ,1/16W	C31	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V
R326	NRSA63J-103N	RESISTOR	10KΩ,1/16W				
R327	NRSA63J-103N	RESISTOR	10KΩ,1/16W				
R328	NRSA63J-103N	RESISTOR	10KΩ,1/16W				

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#△ REF No.	PART No.	PART NAME, DESCRIPTION		#△ REF No.	PART No.	PART NAME, DESCRIPTION	
C51	NCB31HK-222A	CAPACITOR	0.0022μF,50V	C112	NCB31HK-222A	CAPACITOR	0.0022μF,50V
C52	NRSA63J-0R0N	RESISTOR	0Ω,1/16W	C113	NCB31HK-102A	CAPACITOR	0.001μF,50V
C53	NRSA63J-0R0N	RESISTOR	0Ω,1/16W	C114	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V
C54	NEE20JM-475RY	TANTAL CAPACITOR	4.7μF,6.3V	C121	NEH11CM-476NP	E CAPACITOR	47μF,16V
C55	NEE20JM-475RY	TANTAL CAPACITOR	4.7μF,6.3V	C122	NEH31AM-336NZ	E CAPACITOR	33μF,10V
C56	NEH11CM-476NP	E CAPACITOR	47μF,16V	C123	NEH11CM-476NP	E CAPACITOR	47μF,16V
C57	NEN10JM-226NP	E CAPACITOR	22μF,6.3V	C124	NEH31AM-336NZ	E CAPACITOR	33μF,10V
C58	NCS31HJ-101A	CAPACITOR	100PF,50V	C125	NEH11CM-476NP	E CAPACITOR	47μF,16V
C59	NCS31HJ-101A	CAPACITOR	100PF,50V	C126	NEH11CM-476NP	E CAPACITOR	47μF,16V
C60	NEH10JM-476NP	E CAPACITOR	47μF,6.3V	C127	NEH10JM-226N	E CAPACITOR	22μF,6.3V
C61	NCB31HK-222A	CAPACITOR	0.0022μF,50V	C128	NEH10JM-226N	E CAPACITOR	22μF,6.3V
C62	NRSA63J-0R0N	RESISTOR	0Ω,1/16W	C151	NCB31CK-473A	CAPACITOR	0.047μF,16V
C63	NRSA63J-0R0N	RESISTOR	0Ω,1/16W	C152	NEH10JM-226N	E CAPACITOR	22μF,6.3V
C64	NEE20JM-475RY	TANTAL CAPACITOR	4.7μF,6.3V	C153	NEH11HM-225NZ	E CAPACITOR	2.2μF,50V
C65	NEE20JM-475RY	TANTAL CAPACITOR	4.7μF,6.3V	C154	NCB31CK-333A	CAPACITOR	0.033μF,16V
C66	NEH11CM-476NP	E CAPACITOR	47μF,16V	C155	NEN10JM-106NZ	E CAPACITOR	10μF,6.3V
C67	NEN10JM-226NP	E CAPACITOR	22μF,6.3V	C156	NEH11CM-106N	E CAPACITOR	10μF,16V
C68	NCS31HJ-101A	CAPACITOR	100PF,50V	C157	NEH11HM-225NZ	E CAPACITOR	2.2μF,50V
C69	NCS31HJ-101A	CAPACITOR	100PF,50V	C158	NCB31EK-103A	CAPACITOR	0.01μF,25V
C70	NEH10JM-476NP	E CAPACITOR	47μF,6.3V	C159	NEH10JM-107NP	E CAPACITOR	100μF,6.3V
C71	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V	C160	NCB31HK-102A	CAPACITOR	0.001μF,50V
C72	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V	C161	NCB31EK-822A	CAPACITOR	0.0082μF,25V
C73	NEH11CM-476NP	E CAPACITOR	47μF,16V	C162	NCF31CZ-104A	CAPACITOR	0.1μF,16V
C75	NCS31HJ-101A	CAPACITOR	100PF,50V	C163	NCB31HK-222A	CAPACITOR	0.0022μF,50V
C76	NCS31HJ-101A	CAPACITOR	100PF,50V	C164	NCB31HK-821A	CAPACITOR	820PF,50V
C77	NCS31HJ-101A	CAPACITOR	100PF,50V	C165	NCB31EK-392A	CAPACITOR	0.0039μF,25V
C78	NCS31HJ-101A	CAPACITOR	100PF,50V	C166	NEH11CM-106N	E CAPACITOR	10μF,16V
C81	NEH10JM-476NP	E CAPACITOR	47μF,6.3V	C167	NCB31CK-473A	CAPACITOR	0.047μF,16V
C82	NCS31HJ-100A	CAPACITOR	10PF,50V	C168	NEH10JM-107NP	E CAPACITOR	100μF,6.3V
C83	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V	C169	NEH10JM-107NP	E CAPACITOR	100μF,6.3V
C84	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V	C170	NEH10JM-107NP	E CAPACITOR	100μF,6.3V
C85	NCS31HJ-100A	CAPACITOR	10PF,50V	C171	NEH11CM-476NP	E CAPACITOR	47μF,16V
C86	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V	C172	NEE20JM-106RY	TANTAL CAPACITOR	10μF,6.3V
C87	NEH11CM-476NP	E CAPACITOR	47μF,16V	C173	NEE20JM-106RY	TANTAL CAPACITOR	10μF,6.3V
C89	NEH11CM-106N	E CAPACITOR	10μF,16V	C174	NEE20JM-106RY	TANTAL CAPACITOR	10μF,6.3V
C90	NEH11CM-476NP	E CAPACITOR	47μF,16V	C175	NEH10JM-476NP	E CAPACITOR	47μF,6.3V
C91	NCB31CK-473A	CAPACITOR	0.047μF,16V	C176	NCB31EK-103A	CAPACITOR	0.01μF,25V
C92	NEH10JM-107NP	E CAPACITOR	100μF,6.3V	C177	NCS31HJ-561A	CAPACITOR	560PF,50V
C93	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V	C178	NEH11HM-105NZ	E CAPACITOR	1μF,50V
C95	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V	C179	NCB31CK-333A	CAPACITOR	0.033μF,16V
C96	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V	C180	NCB31CK-473A	CAPACITOR	0.047μF,16V
C97	NCS31HJ-100A	CAPACITOR	10PF,50V	C181	NEH11CM-226NP	E CAPACITOR	22μF,16V
C98	NCS31HJ-100A	CAPACITOR	10PF,50V	C182	NEH11HM-225NZ	E CAPACITOR	2.2μF,50V
C99	NEH10JM-476NP	E CAPACITOR	47μF,6.3V	C183	NCB31CK-333A	CAPACITOR	0.033μF,16V
C100	NEH10JM-476NP	E CAPACITOR	47μF,6.3V	C184	NEN10JM-106NZ	E CAPACITOR	10μF,6.3V
C101	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V	C185	NEH11CM-106N	E CAPACITOR	10μF,16V
C102	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V	C186	NEH11HM-225NZ	E CAPACITOR	2.2μF,50V
C103	NCS31HJ-100A	CAPACITOR	10PF,50V	C187	NCB31EK-103A	CAPACITOR	0.01μF,25V
C104	NCS31HJ-100A	CAPACITOR	10PF,50V	C188	NEH10JM-107NP	E CAPACITOR	100μF,6.3V
C105	NEH10JM-476NP	E CAPACITOR	47μF,6.3V	C189	NCB31HK-102A	CAPACITOR	0.001μF,50V
C106	NEN11EM-475NZ	NP E CAPACITOR	4.7μF,25V	C190	NCB31EK-822A	CAPACITOR	0.0082μF,25V
C107	NEN11EM-475NZ	NP E CAPACITOR	4.7μF,25V	C191	NCF31CZ-104A	CAPACITOR	0.1μF,16V
C108	NEH10JM-226N	E CAPACITOR	22μF,6.3V	C192	NCB31HK-222A	CAPACITOR	0.0022μF,50V
C109	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V	C193	NCB31HK-821A	CAPACITOR	820PF,50V
C110	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V	C194	NCB31EK-392A	CAPACITOR	0.0039μF,25V
C111	NCB31HK-222A	CAPACITOR	0.0022μF,50V	C195	NCB31EK-103A	CAPACITOR	0.01μF,25V

#△ REF No.	PART No.	PART NAME, DESCRIPTION		#△ REF No.	PART No.	PART NAME, DESCRIPTION	
C196	NCB31EK-103A	CAPACITOR	0.01μF,25V	C269	NEH10JM-107NP	E CAPACITOR	100μF,6.3V
C201	NEH11CM-476NP	E CAPACITOR	47μF,16V	C270	NEE20JM-475RY	TANTAL CAPACITOR	4.7μF,6.3V
C202	NCS31HJ-101A	CAPACITOR	100PF,50V	C271	NEE21VM-684RY	TANTAL CAPACITOR	0.68μF,35V
C203	NEH11CM-106N	E CAPACITOR	10μF,16V	C272	NEE20JM-106RY	TANTAL CAPACITOR	10μF,6.3V
C204	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V	C275	NEH10JM-226N	E CAPACITOR	22μF,6.3V
C205	NCB31CK-273A	CAPACITOR	0.027μF,16V	C276	QFZ9011-333	MM CAPACITOR	0.033μF
C206	NEH11CM-106N	E CAPACITOR	10μF,16V	C277	NCS31HJ-331A	CAPACITOR	330PF,50V
C207	NCB31EK-822A	CAPACITOR	0.0082μF,25V	C278	NCB31EK-392A	CAPACITOR	0.0039μF,25V
C208	NCB31EK-103A	CAPACITOR	0.01μF,25V	C279	NEH11EM-106NP	E CAPACITOR	10μF,25V
C209	NEH11HM-474NZ	E CAPACITOR	0.47μF,50V	C280	NCB31EK-103A	CAPACITOR	0.01μF,25V
C210	NCB31EK-822A	CAPACITOR	0.0082μF,25V	C281	NCB31EK-103A	CAPACITOR	0.01μF,25V
C211	NCB31HK-272A	CAPACITOR	0.0027μF,50V	C282	NCS31HJ-331A	CAPACITOR	330PF,50V
C212	NCB31HK-102A	CAPACITOR	0.001μF,50V	C283	NCS31HJ-331A	CAPACITOR	330PF,50V
C213	NCB31CK-473A	CAPACITOR	0.047μF,16V	C285	NCB31HK-102A	CAPACITOR	0.001μF,50V
C214	NEH10JM-107NP	E CAPACITOR	100μF,6.3V	C286	NCB31HK-102A	CAPACITOR	0.001μF,50V
C215	NCB31EK-103A	CAPACITOR	0.01μF,25V	C287	NEH10JM-476NP	E CAPACITOR	47μF,6.3V
C216	NCB31CK-333A	CAPACITOR	0.033μF,16V	C288	NEE21CM-225RY	TANTAL CAPACITOR	2.2μF,16V
C218	NEH11CM-106N	E CAPACITOR	10μF,16V	L1	PELN0840-330MY	COIL	
C221	NCF31CZ-104A	CAPACITOR	0.1μF,16V	L2	PELN0840-330MY	COIL	
C222	NCF31CZ-104A	CAPACITOR	0.1μF,16V	L3	PELN0840-330MY	COIL	
C223	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V	L4	PELN0840-330MY	COIL	
C224	QCYA1CK-683	CAPACITOR	0.068μF,16V	L11	YU41135-221K	COIL	220μH
C225	NCF31CZ-104A	CAPACITOR	0.1μF,16V	L12	YU41135-221K	COIL	220μH
C231	NEE21AM-476RZ	TANTAL CAPACITOR	47μF,10V	L13	YU41135-221K	COIL	220μH
C232	NCS31HJ-101A	CAPACITOR	100PF,50V	L14	PU53607-472	COIL	4.7mH
C233	NEH11CM-106N	E CAPACITOR	10μF,16V	L15	PGZ00917-152	COIL	
C234	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V	L16	PU53607-472	COIL	4.7mH
C235	NCB31CK-273A	CAPACITOR	0.027μF,16V	L17	PGZ00917-152	COIL	
C236	NEH11CM-106N	E CAPACITOR	10μF,16V	L18	YU41135-221K	COIL	220μH
C237	NCB31EK-822A	CAPACITOR	0.0082μF,25V	L19	YU40932-P	OSC COIL	
C238	NCB31EK-103A	CAPACITOR	0.01μF,25V	L20	YU41135-221K	COIL	220μH
C239	NEH11HM-474NZ	E CAPACITOR	0.47μF,50V	LPF1	PU60206	LOW PASS FILTER	
C240	NCB31EK-822A	CAPACITOR	0.0082μF,25V	LPF2	PU60206	LOW PASS FILTER	
C241	NCB31HK-272A	CAPACITOR	0.0027μF,50V	BPF1	YU41191-P	BAND PASS FILTER(1.4M)	
C242	NCB31HK-102A	CAPACITOR	0.001μF,50V	BPF2	YU41192-P	BAND PASS FILTER(1.8M)	
C243	NCB31CK-473A	CAPACITOR	0.047μF,16V	SW1	PGZ01322	SWITCH, AUDIO INPUT SEL(L)	
C244	NEH10JM-107NP	E CAPACITOR	100μF,6.3V	SW2	PGZ01776	SWITCH, AUDIO INPUT SEL(R)	
C245	NCB31EK-103A	CAPACITOR	0.01μF,25V	SW3	QSS1A42-L01	SWITCH, AUDIO INPUT LEV(L)	
C246	NCB31CK-333A	CAPACITOR	0.033μF,16V	SW4	QSS1A42-L01	SWITCH, AUDIO INPUT LEV(R)	
C248	NEE20JM-106RY	TANTAL CAPACITOR	10μF,6.3V	SW5	PGZ01322	SWITCH, S-VHS	
C249	NCF31CZ-104A	CAPACITOR	0.1μF,16V	SW6	PGZ01322	SWITCH, VIDEO OUT	
C250	NCF31CZ-104A	CAPACITOR	0.1μF,16V	SW7	PGZ01322	SWITCH, AEF	
C251	NCF31CZ-104A	CAPACITOR	0.1μF,16V	SW8	PGZ01322	SWITCH, AUTO REVIEW	
C252	NCF31CZ-104A	CAPACITOR	0.1μF,16V	SW9	PGZ01322	SWITCH, REC LEVEL	
C253	NEH11EM-475NZ	E CAPACITOR	4.7μF,25V	SW10	PGZ01322	SWITCH, DOLBY NR	
C254	QCYA1CK-683	CAPACITOR	0.068μF,16V	SW11	PGZ01793	SWITCH, HI-FI REC	
C255	NCF31CZ-104A	CAPACITOR	0.1μF,16V	SW12	PGZ01322	SWITCH, AUDIO OUT	
C261	NEE20JM-475RY	TANTAL CAPACITOR	4.7μF,6.3V	SW13	PGZ01772	SWITCH, VITC	
C262	NEE20JM-475RY	TANTAL CAPACITOR	4.7μF,6.3V	SW14	PGZ01772	SWITCH, LTC	
C263	NEE20JM-475RY	TANTAL CAPACITOR	4.7μF,6.3V	SW16	PGZ01772	SLIDE SWITCH, RUN	
C264	NEE21VM-684RY	TANTAL CAPACITOR	0.68μF,35V				
C265	NEE20JM-106RY	TANTAL CAPACITOR	10μF,6.3V				
C266	NEE20JM-475RY	TANTAL CAPACITOR	4.7μF,6.3V				
C267	NEH11EM-336NP	E CAPACITOR	33μF,25V				
C268	NEE20JM-475RY	TANTAL CAPACITOR	4.7μF,6.3V				

<07><08>

#△ REF No.	PART No.	PART NAME, DESCRIPTION
SW17	PGZ01249	TACT SWITCH, HOLD
SW18	PGZ01249	TACT SWITCH, SHIFT
SW19	PGZ01249	TACT SWITCH, ADVANCE
SW20	PGZ01249	TACT SWITCH, PRESET
SW21	NSRA002-L01Z	ROTARY SW, MIC AMP GAIN(L)
SW22	NSRA002-L01Z	ROTARY SW, MIC AMP GAIN(R)
SW23	PU54440	SWITCH, LIMITER
SW24	PGZ01776	SLIDE SWITCH, MONITOR OUT
VA1	PU49624-2	VARISTOR
VA2	PU49624-2	VARISTOR
VA3	PU49624-2	VARISTOR
VA4	PU49624-2	VARISTOR
TP1	PGZ01015	TEST PIN, X25(TP1-25,GND1-3)
CN1	YU40108-24	CONNECTOR
CN2	PU60566-110	CONNECTOR
CN3	YU40096-3	CONNECTOR
CN4	YU40096-3	CONNECTOR
CN5	YU40096-3	CONNECTOR
CN6	YU40095-3	CONNECTOR
CN7	YU40095-3R	CONNECTOR
CN8	YU40095-2	CONNECTOR
CN9	YU40771-12	B TO B CONNECTOR
CN10	YU41356-2-P	CONNECTOR

DISPLAY BOARD ASSEMBLY <08>

PWBA	PGZ01924	LCD BOARD ASSY, PAL
BL1	PGZ01930	BACK LIGHT ASSY
LCD1	PGZ01931	LCD
IC1	UPD75P308GF-R17	IC, PAL
IC2	TC4021BF	IC
IC3	S-8054HN-CB-X	IC
IC4	TC4094BF	IC
IC5	M51944BML	IC
Q1	2SD602	TRANSISTOR
Q2	IMD2	TRANSISTOR
Q3	IMD2	TRANSISTOR
Q6	IMD2	TRANSISTOR
Q9	2SD601A	TRANSISTOR
Q10	DTA124EK	TRANSISTOR

#△ REF No.	PART No.	PART NAME, DESCRIPTION	
LD1	TLSG208	LE DIODE	
R2	QRSA08J-104YN	RESISTOR	100KΩ,1/10W
R3	QRSA08J-104YN	RESISTOR	100KΩ,1/10W
R4	QRSA08J-224YN	RESISTOR	220KΩ,1/10W
R5	QRSA08J-224YN	RESISTOR	220KΩ,1/10W
R6	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
R7	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
R8	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
R9	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
R10	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
R11	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
R12	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
R13	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
R14	QRSA08J-104YN	RESISTOR	100KΩ,1/10W
R15	QRSA08J-104YN	RESISTOR	100KΩ,1/10W
R16	QRSA08J-104YN	RESISTOR	100KΩ,1/10W
R17	QRS188J-751YN	RESISTOR	750Ω,1/8W
R18	QRS188J-751YN	RESISTOR	750Ω,1/8W
R19	QRS188J-751YN	RESISTOR	750Ω,1/8W
R20	QRS188J-751YN	RESISTOR	750Ω,1/8W
R21	QRS188J-751YN	RESISTOR	750Ω,1/8W
R22	QRS188J-751YN	RESISTOR	750Ω,1/8W
R23	QRS188J-751YN	RESISTOR	750Ω,1/8W
R24	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R25	QRSA08J-472YN	RESISTOR	4.7KΩ,1/10W
R26	QRSA08J-182YN	RESISTOR	1.8KΩ,1/10W
R28	QRSA08J-564YN	RESISTOR	560KΩ,1/10W
R29	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
R30	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
R31	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
R32	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
R33	QRSA08J-333YN	RESISTOR	33KΩ,1/10W
R34	QRSA08J-562YN	RESISTOR	5.6KΩ,1/10W
R35	QRSA08J-562YN	RESISTOR	5.6KΩ,1/10W
R36	QRSA08J-562YN	RESISTOR	5.6KΩ,1/10W
R37	QRSA08J-333YN	RESISTOR	33KΩ,1/10W
R38	QRSA08J-104YN	RESISTOR	100KΩ,1/10W
R39	QRSA08J-472YN	RESISTOR	4.7KΩ,1/10W
R40	QRSA08J-104YN	RESISTOR	100KΩ,1/10W
R41	QRSA08J-333YN	RESISTOR	33KΩ,1/10W
R42	QRSA08J-104YN	RESISTOR	100KΩ,1/10W
R43	QRSA08J-103YN	RESISTOR	10KΩ,1/10W
R44	QRSA08J-224YN	RESISTOR	220KΩ,1/10W
R45	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R47	QRSA08J-333YN	RESISTOR	33KΩ,1/10W
R50	QRSA08J-104YN	RESISTOR	100KΩ,1/10W
R51	QRSA08J-104YN	RESISTOR	100KΩ,1/10W
R52	QRSA08J-104YN	RESISTOR	100KΩ,1/10W
R53	QRSA08J-104YN	RESISTOR	100KΩ,1/10W
R54	QRSA08J-104YN	RESISTOR	100KΩ,1/10W
R55	QRSA08J-104YN	RESISTOR	100KΩ,1/10W
R56	QRSA08J-102YN	RESISTOR	1KΩ,1/10W
R57	QRSA08J-104YN	RESISTOR	100KΩ,1/10W
R58	QRSA08J-182YN	RESISTOR	1.8KΩ,1/10W
R60	QRSA08J-104YN	RESISTOR	100KΩ,1/10W

#△ REF No.	PART No.	PART NAME, DESCRIPTION	
R62	QRSA08J-104YN	RESISTOR	100KΩ,1/10W
R63	QRSA08J-474YN	RESISTOR	470KΩ,1/10W
R64	QRSA08J-823YN	RESISTOR	82KΩ,1/10W
R66	QRSA08J-0R0Y	RESISTOR, JP2 (PAL)	0Ω,1/10W
C1	PGZ01933-476	E CAPACITOR	-40μF
C2	QCYA1HK-223	CAPACITOR	0.022μF,50V
C3	QCYA1HK-472	CAPACITOR	0.0047μF,50V
C4	PGZ01934-105	E CAPACITOR	-1PF
C5	QCTA1CH-100	CAPACITOR	10PF,16V
C6	QCTA1CH-330	CAPACITOR	33PF,16V
C7	QCTA1CH-100	CAPACITOR	10PF,16V
C8	QCTA1CH-220	CAPACITOR	22PF,16V
C9	QCFA1EZ-104	CAPACITOR	0.1μF,25V
C10	QCFA1EZ-104	CAPACITOR	0.1μF,25V
C11	QCFA1EZ-104	CAPACITOR	0.1μF,25V
C12	PGZ01935-226	E CAPACITOR	0.00-2μF
L1	YU40500-221KZ	COIL	220μH
X1	PGZ01925	CRYSTAL RESONATOR	
X2	PGZ01926	CRYSTAL RESONATOR	
SW1	PGZ01852	TACT SWITCH, RESET	
SW2	PGZ01852	TACT SWITCH, SELECT	
SW3	PGZ01927-008	DIP SWITCH	
SW9	PGZ01322	SWITCH, LIGHT	
SW10	PGZ01776	SLIDE SWITCH, UB/TC/COUNTER	
CN1	PGZ01932-018Z	CONNECTOR	
CN2	PGZ01715-050	CONNECTOR	

MOTHER BOARD ASSEMBLY <10>

PWBA	PRK20165A-05	MOTHER BOARD ASSY
SLD1	PRD44142	INSULATOR
WR1	PGW0204-080100	FLAT WIRE
WR2	PGZ01794-01-01	FLAT WIRE
WR3	PGW0208-100240	FLAT WIRE
CN1	PGZ01713-100	HALF PITCH CONNECTOR
CN2	PGZ01713-32	HALF PITCH CONNECTOR
CN3	PGZ01720-30	HINGE CONNECTOR
CN4	PU59973-14	CONNECTOR
CN5	YU40096-2	CONNECTOR
CN6	YU40771-20	B TO B CONNECTOR

#△ REF No.	PART No.	PART NAME, DESCRIPTION
CN7	YU40771-20	B TO B CONNECTOR
CN8	YU40105-20	B TO B CONNECTOR
CN9	PU58844-4	CONNECTOR
CN10	PGZ01787-10	CONNECTOR
CN11	PGZ01787-18	CONNECTOR
CN12	YU40670-24	CONNECTOR
CN13	PU59973-20	CONNECTOR

P/R JUNC BOARD ASSEMBLY <11>

PWBA	PRK20247A-01	PRE/REC JUNC BOARD ASSY	
Q1	DTC124EU	TRANSISTOR	
Q2	DTA124EU	TRANSISTOR	
Q3	DTA124EU	TRANSISTOR	
Q4	2SC4081(QRS)	TRANSISTOR	
Q5	2SC4097(QR)	TRANSISTOR	
Q6	2SC4081(QRS)	TRANSISTOR	
R1	NRSA63J-223N	RESISTOR	22KΩ,1/16W
R2	NRSA63J-472N	RESISTOR	4.7KΩ,1/16W
R3	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R4	NRSA63J-4R7N	RESISTOR	4.7Ω,1/16W
R5	NRSA63J-393N	RESISTOR	39KΩ,1/16W
R6	NRSA63J-103N	RESISTOR	10KΩ,1/16W
R7	NRSA63J-102N	RESISTOR	1KΩ,1/16W
R8	NRSA63J-471N	RESISTOR	470Ω,1/16W
R9	NRSA63J-101N	RESISTOR	100Ω,1/16W
C1	NEE21EM-105RY	TANTAL CAPACITOR	1μF,25V
C2	QFZ9011-333	MM CAPACITOR	0.033μF
C3	NCS31HJ-561A	CAPACITOR	560PF,50V
C4	NCB31EK-392A	CAPACITOR	0.0039μF,25V
C5	NEH11EM-106NP	E CAPACITOR	10μF,25V
C7	QFN41HJ-104	M CAPACITOR	0.1μF,50V
C8	NCF31CZ-104A	CAPACITOR	0.1μF,16V
C9	QFP42AJ-562	PP CAPACITOR	0.0056μF,100V
L1	YU40932-P	OSC COIL	
L2	PU58201-101J	COIL	100μH
L3	PU54710-822	COIL	8.2mH
WR1	PGW0206-120110	FLAT WIRE	
TP1	PU54983	TEST PIN, X5(TP1-5)	
CN1	YU40101-20	CONNECTOR	
CN2	PGZ01932-011Z	CONNECTOR	
CN3	YU40095-9	CONNECTOR	
CN4	YU40095-2R	CONNECTOR	

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#△ REF No.	PART No.	PART NAME, DESCRIPTION
CN5	YU40095-2	CONNECTOR

POWER CTL BOARD ASSEMBLY <14>

PWBA	PRK20249B	POWER CTL BOARD ASSY	
Q1	DTA114WK	TRANSISTOR	
Q2	DTC114WK	TRANSISTOR	
Q3	2SD601A	TRANSISTOR	
Q4	DTC143XK	TRANSISTOR	
Q5	DTA114TK	TRANSISTOR	
Q6	2SD601A	TRANSISTOR	
Q7	DTC114WK	TRANSISTOR	
D1	DAN202K	DIODE	
D2	DAN202K	DIODE	
D3	RD10EB1	ZENER DIODE	
D5	DAN202K	DIODE	
D6	ERA81-004-F	DIODE	
D7	RD10EB2	ZENER DIODE	
D8	DAN202K	DIODE	
R1	QRSA08J-332YN	RESISTOR	3.3KΩ, 1/10W
R2	QRSA08J-102YN	RESISTOR	1KΩ, 1/10W
R3	QRSA08J-104YN	RESISTOR	100KΩ, 1/10W
R4	QRSA08J-223YN	RESISTOR	22KΩ, 1/10W
R5	QRSA08J-473YN	RESISTOR	47KΩ, 1/10W
B6	QRSA08J-0R0Y	RESISTOR	0Ω, 1/10W
C1	NEE20JM-475RY	TANTAL CAPACITOR	4.7μF, 6.3V
C2	NEE21DM-475RY	TANTAL CAPACITOR	4.7μF, 20V
L1	PGZ00643	COIL	
△ L2	EXC-EMT102BC	N FILTER	
RY1	PGZ01743	RELAY	
CL1	PU55379	MINI CLAMP, X4	
CN1	PU58844-4	CONNECTOR	
CN2	PU58844-4	CONNECTOR	
CN3	PGZ00652-002	CONNECTOR	
CN5	PGZ00651-004	CONNECTOR	
△ CP1	ICP-F10	CIRCUIT PROTECTOR	

#△ REF No.	PART No.	PART NAME, DESCRIPTION
△ CP2	ICP-F10	CIRCUIT PROTECTOR

- POWER CTL SUB BOARD ASSY -

PWBA	PRK20261A	POWER CTL SUB BOARD ASSY	
Q1	2SC4081(QRS)	TRANSISTOR	
Q2	2SC4081(QRS)	TRANSISTOR	
Q3	2SK621	FE TRANSISTOR	
D4	MA742	DIODE	
R1	NRSA63J-273N	RESISTOR	27KΩ, 1/16W
R2	NRSA63J-155N	RESISTOR	1.5MΩ, 1/16W
R3	NRSA63J-155N	RESISTOR	1.5MΩ, 1/16W
R4	NRSA63J-273N	RESISTOR	27KΩ, 1/16W
R6	NRSA63J-0R0N	RESISTOR	0Ω, 1/16W
C1	QCYA1EK-104	CAPACITOR	0.1μF, 25V
C2	NEE21DM-225RY	TANTAL CAPACITOR	2.2μF, 20V

CONNECTOR BOARD ASSEMBLY <15>

PWBA	PRK20253A	CONNECTOR BOARD ASSY	
B2	QRSA08J-0R0Y	RESISTOR, X4	0Ω, 1/10W
SW1	PGZ01785	SLIDE SWITCH, VIDEO OUT SEL	
JA3	PGZ01671	PIN JACK, AUDIO CH1	
JA4	PGZ01671	PIN JACK, AUDIO CH2	
WR1	PGW0206-070140	FLAT WIRE	
CN1	YU40108-14	CONNECTOR	

50 PIN BOARD ASSEMBLY <16>

PWBA	PRK20180A-01	50PIN BOARD ASSY	
WR1	PGZ01795	FFC WIRE	

#△ REF No.	PART No.	PART NAME, DESCRIPTION
CN1	PGZ01759	50P CONNECTOR
CN2	YU40108-20	CONNECTOR
CN3	PU58844-104	CONNECTOR

MODE SENESOR BOARD <17>

PWB	PU56617-1-2	MODE SENSOR BOARD
Q1	PT431F	PHOTO TRANSISTOR
Q2	PT431F	PHOTO TRANSISTOR
D1	GL430	EMITTING DIODE
D2	GL430	EMITTING DIODE
R1	QRD161J-222	RESISTOR 2.2KΩ,1/6W
BKT1	PQ30978	MODE SENSOR BRACKET

OPERATION BOARD ASSEMBLY <18>

PWBA	PRK20173A-06	OPERATION BOARD ASSY
IC1	TC4094BF	IC
IC2	TC4094BF	IC
Q1	DTC124EK	TRANSISTOR
Q2	DTC124EK	TRANSISTOR
Q3	DTC124EK	TRANSISTOR
Q4	DTC124EK	TRANSISTOR
Q5	DTC124EK	TRANSISTOR
Q6	DTC124EK	TRANSISTOR
Q7	DTC124EK	TRANSISTOR
Q8	DTC124EK	TRANSISTOR
Q9	DTC124EK	TRANSISTOR

LD1	SLM-13VWF-X	LE DIODE
LD2	SLM-13VWF-X	LE DIODE
LD3	SLM-13VWF-X	LE DIODE
LD4	SLM-13VWF-X	LE DIODE
LD5	SLM-13VWF-X	LE DIODE
LD6	SLM-13VWF-X	LE DIODE
LD7	SLM-13VWF-X	LE DIODE
LD8	SLM-13VWF-X	LE DIODE
LD9	GL5HD60	LE DIODE

#△ REF No.	PART No.	PART NAME, DESCRIPTION
R1	QRSA08J-222YN	RESISTOR 2.2KΩ,1/10W
R2	QRSA08J-222YN	RESISTOR 2.2KΩ,1/10W
R3	QRSA08J-332YN	RESISTOR 3.3KΩ,1/10W
R4	QRSA08J-472YN	RESISTOR 4.7KΩ,1/10W
R5	QRSA08J-103YN	RESISTOR 10KΩ,1/10W
R6	QRSA08J-182YN	RESISTOR 1.8KΩ,1/10W
R7	QRSA08J-182YN	RESISTOR 1.8KΩ,1/10W
R8	QRSA08J-182YN	RESISTOR 1.8KΩ,1/10W
R9	QRSA08J-182YN	RESISTOR 1.8KΩ,1/10W
R10	QRSA08J-182YN	RESISTOR 1.8KΩ,1/10W

R11	QRSA08J-182YN	RESISTOR 1.8KΩ,1/10W
R12	QRSA08J-182YN	RESISTOR 1.8KΩ,1/10W
R13	QRSA08J-182YN	RESISTOR 1.8KΩ,1/10W
R14	QRSA08J-182YN	RESISTOR 1.8KΩ,1/10W
R15	QRSA08J-104YN	RESISTOR 100KΩ,1/10W
R16	QRSA08J-102YN	RESISTOR 1KΩ,1/10W

C1	QCFA1EZ-104	CAPACITOR 0.1μF,25V
C2	QCFA1EZ-104	CAPACITOR 0.1μF,25V
C3	QCFA1EZ-104	CAPACITOR 0.1μF,25V

SW1	PGZ01249	TACT SWITCH, STOP
or PGZ01852		TACT SWITCH
SW2	PGZ01249	TACT SWITCH, REW
or PGZ01852		TACT SWITCH
SW3	PGZ01249	TACT SWITCH, FF
or PGZ01852		TACT SWITCH
SW4	PGZ01249	TACT SWITCH, PLAY
or PGZ01852		TACT SWITCH
SW5	PGZ01249	TACT SWITCH, PAUSE/STILL
or PGZ01852		TACT SWITCH
SW6	PGZ01249	TACT SWITCH, EJECT
or PGZ01852		TACT SWITCH
SW7	PGZ01249	TACT SWITCH, REC/INSERT
or PGZ01852		TACT SWITCH
SW8	PGZ01775	SLIDE SWITCH, TALLY
SW9	PGZ01810	PUSH SWITCH, OPERATE

SPC1	PU50633-3	LED SPACER
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WR1	PGW0206-090100	FLAT WIRE
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CN1	YU40670-10	CONNECTOR
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MDA BOARD ASSEMBLY <19>

PWBA	PRK20178A1-01	MDA BOARD ASSY
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IC1	BA6452F	IC
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<19><20><21><22><23>

#△ REF No.	PART No.	PART NAME, DESCRIPTION	
D1	DAN202K	DIODE	
R1	QRSA08J-152YN	RESISTOR	1.5KΩ, 1/10W
R2	QRSA08J-154YN	RESISTOR	150KΩ, 1/10W
R3	QRSA08J-223YN	RESISTOR	22KΩ, 1/10W
R4	QRSA08J-222YN	RESISTOR	2.2KΩ, 1/10W
R5	QRSA08J-101YN	RESISTOR	100Ω, 1/10W
R6	QRSA08J-2R2YN	RESISTOR	2.2Ω, 1/10W
R7	QRSA08J-2R2YN	RESISTOR	2.2Ω, 1/10W
R8	QRSA08J-2R2YN	RESISTOR	2.2Ω, 1/10W
△ R9	QRG125J-R68AR	MF RESISTOR	0.68Ω, 1/2W
R10	QRSA08J-104YN	RESISTOR	100KΩ, 1/10W
C1	QCY81CK-224	CAPACITOR	0.22μF, 16V
C2	QCSA1HJ-471	CAPACITOR	470PF, 50V
C3	QCY81CK-224	CAPACITOR	0.22μF, 16V
C4	QCFA1EZ-104	CAPACITOR	0.1μF, 25V
C5	NEE21AM-106RY	TANTAL CAPACITOR	10μF, 10V
C6	NEE21AM-106RY	TANTAL CAPACITOR	10μF, 10V
C7	QCYA1EK-223	CAPACITOR	0.022μF, 25V
C8	NEE21AM-106RY	TANTAL CAPACITOR	10μF, 10V
C9	NEE21AM-106RY	TANTAL CAPACITOR	10μF, 10V
C10	QCFA1EZ-104	CAPACITOR	0.1μF, 25V
C11	NEE21AM-106RY	TANTAL CAPACITOR	10μF, 10V
WR1	PGW0206-040100	FLAT WIRE	
CN1	PU59973-10	CONNECTOR	
CN2	YU40095-2	CONNECTOR	
CN3	YU40095-15	CONNECTOR	

MECHA IF BOARD ASSEMBLY <20>

PWBA	PRK20178A2-01	MECHA IF BOARD ASSY	
IC1	GP2L09BC	PHOTO SENSOR	
D1	DA204U	DIODE	
R1	QRSA08J-680YN	RESISTOR	68Ω, 1/10W
R2	QRSA08J-471YN	RESISTOR	470Ω, 1/10W
R3	QRSA08J-471YN	RESISTOR	470Ω, 1/10W
C1	QEPA1HM-105	E CAPACITOR	1μF, 50V
HD1	YQ30060-1-2	TU.SENSOR HOLDER	

#△ REF No.	PART No.	PART NAME, DESCRIPTION	
CN1	PU59973-20	CONNECTOR	
CN2	YU40095-7	CONNECTOR	
CN3	YU40095-2	CONNECTOR	
CN4	YU40095-2R	CONNECTOR	
CN5	YU40095-2B	CONNECTOR	
CN6	YU40095-2Y	CONNECTOR	
CN7	YU40095-2B	CONNECTOR	
CN8	YU40095-2Y	CONNECTOR	
CN9	YU40095-3R	CONNECTOR	
CN10	YU40095-4	CONNECTOR	

MECHA JUNC BOARD ASSEMBLY <21>

PWBA	PRK20172A-02	MECHA JUNCTION BOARD ASSY	
SPC1	PRD30030-113	SPACER	
WR1	PGW0206-040200	FLAT WIRE	
CN1	YU40773-20	CONNECTOR	
CN2	YU40773-20	CONNECTOR	
CN3	PU59973-10	CONNECTOR	
CN4	YU40108-10	CONNECTOR	
CN5	YU40108-20	CONNECTOR	
CN6	YU40095-2	CONNECTOR	
CN8	YU40096-2	CONNECTOR	

END SENSOR BOARD <22>

PWBA	PRK20178A4-03	END SENSOR BOARD ASSY	
Q1	PN268VI	PHOTO TRANSISTOR	
C1	QCV C1CM-103	CAPACITOR	0.01μF, 16V

START SENSOR BOARD <23>

PWBA	PRK20178A3-02	START SENSOR BOARD ASSY	
Q1	TPS605	PHOTO TRANSISTOR	

#△ REF No.	PART No.	PART NAME, DESCRIPTION
C1	QCVC1CN-103	CAPACITOR 0.01μF,16V

MDA JUNC BOARD ASSEMBLY <24>

PWBA	PRK20248A	MDA JUNC BOARD ASSY
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CN1	YU40096-15	CONNECTOR
CN2	YU40095-15	CONNECTOR

POWER SW BOARD ASSEMBLY <25>

PWBA	PRK30097A	POWER SW BOARD ASSY
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SW1	PGZ00597	MAIN SWITCH
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A/C HEAD BOARD <26>

PWBA	PRK30096A	A/C HEAD BOARD ASSY
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CN1	YU40095-6	CONNECTOR
CN2	YU40095-2	CONNECTOR

REEL SENSOR BOARD <35>

PWB	PU58141	REEL SENSOR BOARD
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PHS1	GP2L04BC	PHOTO SENSOR
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SCW1	HPSF2060Z	SCREW
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SECTION 7
TECHNICAL INFORMATION

7.1 POWER SUPPLY CIRCUIT

7.1.1 Supply powers

Power supplied to the set through the DC IN or the BATT IN terminal is selected by RY1 of the POWER CTL board and then supplied to the REGULATOR board via the main switch and the breaker.

In the REGULATOR board, the supply voltage is transformed to the specific voltages for the AL and SW systems.

The AL voltages are turned on when the main switch of the VTR is on and it is supplied to the syscon, the display micro-computer, etc.

The SW voltage is controlled by the syscon and it is converted into SW 12 V, SW 9 V and SW 5 V powers. SW 5 V and

SW 9 V are generated by the switching regulator, and their voltages are controlled by changing the phase of the sawtooth waveform output from IC1 and they are switched by Q3, Q4 and Q5.

SAVE 9 V is used when this set is used as the VTR of the GY-X2E video camera. In concrete, when the GY-X2E docked with this VTR is in the POWER SAVE mode and the VTR is turned off, SAVE 9 V is used to output the camera's video and audio signals through the VTR OUT terminal. For a reference the BR-S422E is incapable of outputting those signals alone in the POWER SAVE mode since the power functions as same as for the SW system in that event.

● Operational status of VTR and video camera which are docked as one set

Note: When the BR-S422E and GY-X2E video camera are docked with each other, power on/off status of respective units is different from each other in the POWER SAVE mode.

Camera's OPERATE switch setting	Camera's power status	Power supply to BR-S422E	VTR of GY-X2E
ON	ON	ON	ON
SAVE	ON	OFF	ON (EE only)
OFF	OFF	OFF	OFF

Table 7-1-1

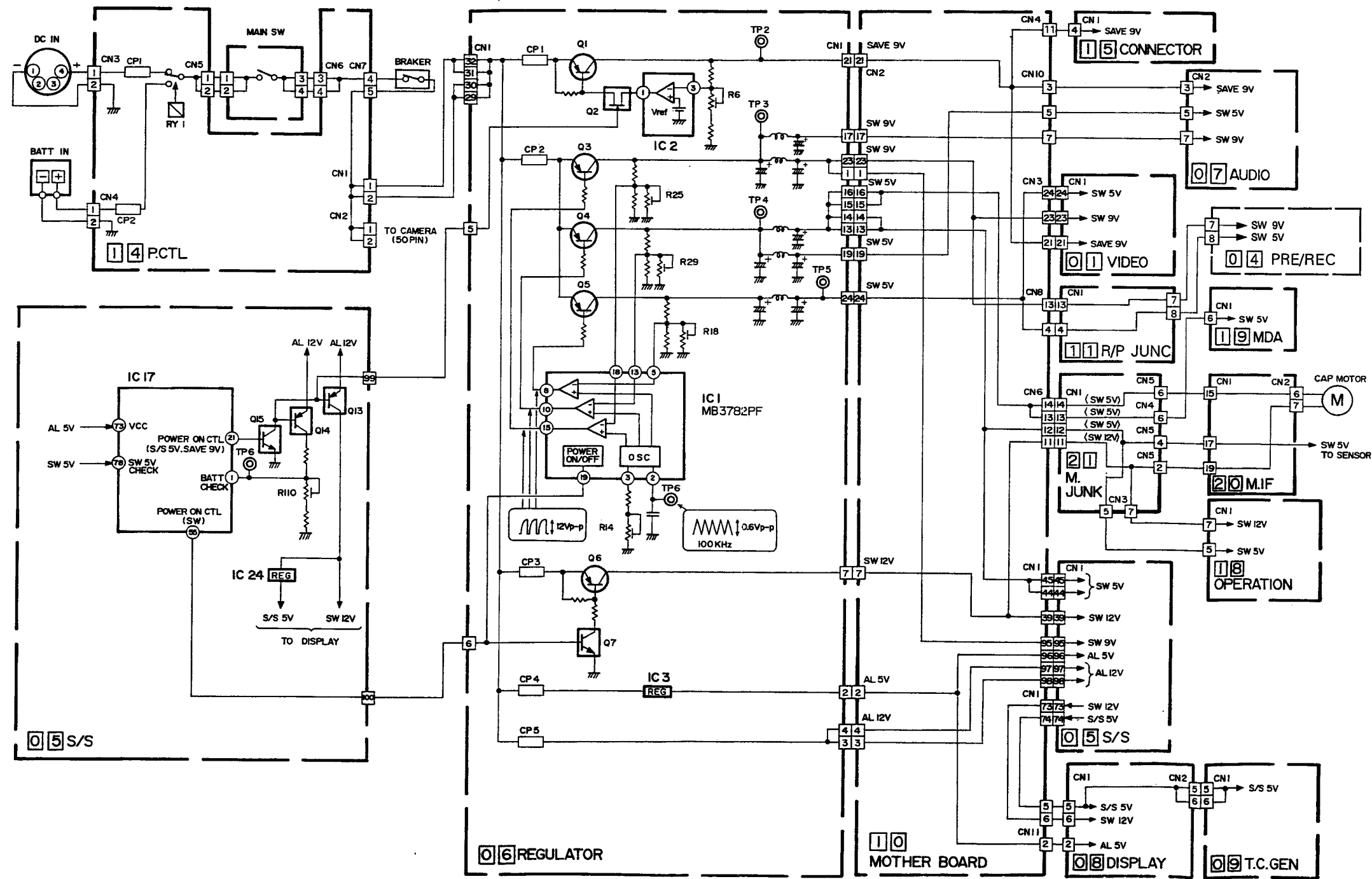


Fig. 7-1-1 Power supply circuit

7.1.2 Power control

IC17 of the S/S board is the main microprocessor which is operated with AL5V power. This microprocessor controls power supply as follows.

Pin No.	Name	Description
1	BATT	To check supply voltage. Enters the set in the BATT WARNING mode with voltage down by 10.95 V DC.
21	POWER ON CTL (SAVE)	To control S/S 5 V, SW 12 V (both generated in the S/S board) and SAVE 9 V powers. S/S 5 V is supplied to the DISPLAY board and the TC board, SW 12 V is used for the LED and back light of the DISPLAY board.
55	POWER ON CTL (SW)	To control SW 9 V, SW 5 V and SW 12 V generated by the REGULATOR board.
73	Vcc	AL 5 V input as the source power of the microprocessor.
78	SW5V CHECK	To check supply condition of SW 5 V power. When this power is not supplied, the mechanism is off operation since it operates with the SW 5 V power.

Table 7-1-2

7.1.3 Operation of POWER CTL board

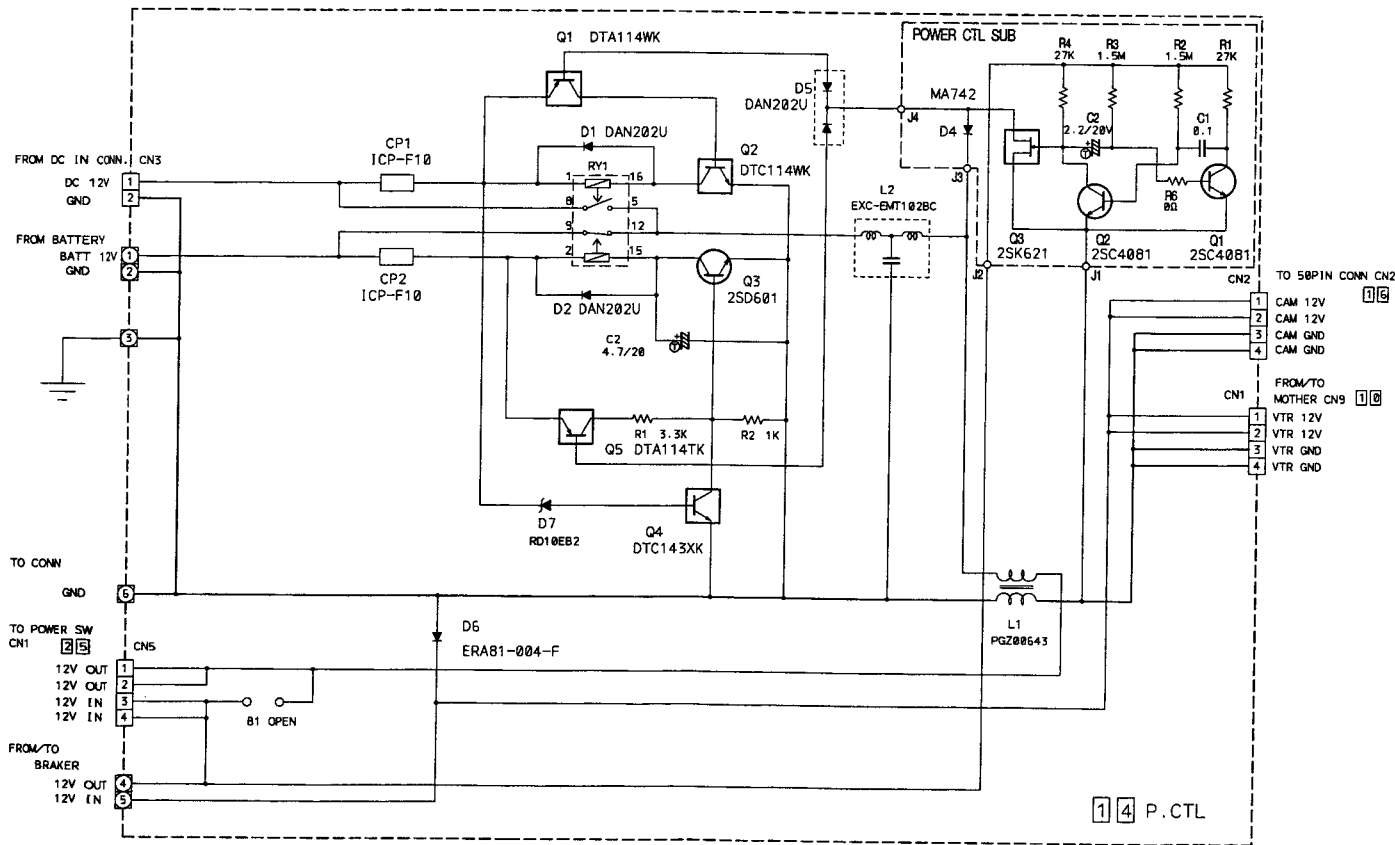


Fig. 7-1-2 POWER CTL board

The POWER CTL board switches between power inputs from the DC IN and BATT IN connectors. In the BR-S411E power input is switched by the diode, however, it has the following disadvantages.

- 1) High rate of power consumption (1 W approx. because of voltage loss made by the diode).
- 2) Earlier low battery indication than its real life due to the voltage drop by a diode.

The BR-S422E improves those disadvantages by incorporating the latching type relay for switching power supply. This switching system maintains the switching mode that was once set by current flow in the internal coil of the relay without further current flow.

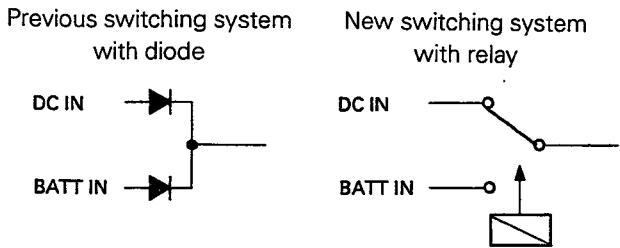


Fig. 7-1-3

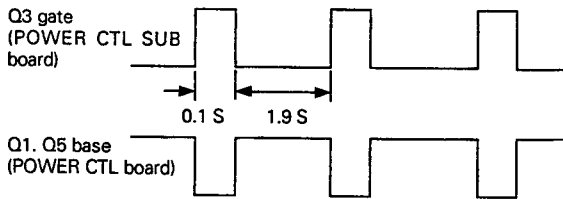


Fig. 7-1-4 RELAY ON CTL pulse

The following explains about the case that power is supplied to the DC IN during active power supply from the BATT IN. In that event, Q4 is turned on while Q3 is turned off, however, the relay is maintained in the BATT IN side and it will be switched to the DC IN side when Q1 is turned on by POWER ON CTL pulse. In another case that power is supplied both to the DC IN and BATT IN, disconnection of the DC IN turns off Q4 and D4's cathode voltage drops down to 0 V. However, this voltage drop is not figured in a straight line but in a slow curve to 0 V. The beginning of voltage drop is detected by the base of Q5 together with functions of D4 and D5 and Q5 momentarily turns on to switch the relay to the BATT IN side.

The switching operation of the relay system will be described below. First, RY1 has two switches which are alternately turned on and off to switch the power supply without fail. When power is supplied through the DC IN, the emitter and the base of the digital transistor Q1 are supplied with 12 V power. However, the base current flows through D5 and D4 to respective circuits (mainly to capacitors) of the VTR section. Therefore, the potential of the base does not turn to H level immediately after the power supply, but it has L level for a moment when current flows to capacitors of respective circuits, and Q1 is turned on in this short period. Consequently, Q2 is turned on and current flows through the coil of the relay to switch the power line to the DC IN. On the other hand, voltage supplied from the DC IN flows via D7 to Q4 to turn it on while Q3 is accordingly turned off to prohibit operation of the switch for the BATT IN side. Q4 is a transistor to give priority to the DC IN line. Secondly, when power is supplied through the BATT IN, Q4 does not turn on while Q5 and Q3 are turned on to switch the relay to the BATT IN side. The POWER CTL SUB board functions as the free-running multivibrator, and it constantly outputs the pulse shown in Fig. 7-1-4 from the gate of Q3. This pulse is supplied to D5 to turn on Q1 and Q5 on the POWER CTL board every two seconds in order to supply current in the relay coil. This function is prepared for maintaining normal switch operations on the assumption of the worst case such as a strong chock is given to the VTR and the relay switch resultingly falls in poor contact. However, the relay is highly reliable to shock and any abnormal switching owing to poor contact cannot be expected in usual use.

7.2 SYSCON/SERVO CIRCUIT

7.2.1 System control section

1. General

This model has two CPUs in the syscon circuit of the S/S board and the DISPLAY board (IC17 in the former and IC1 in the latter). Their controls of respective boards are serially operated in consideration of the expansibility and reduction of wires.

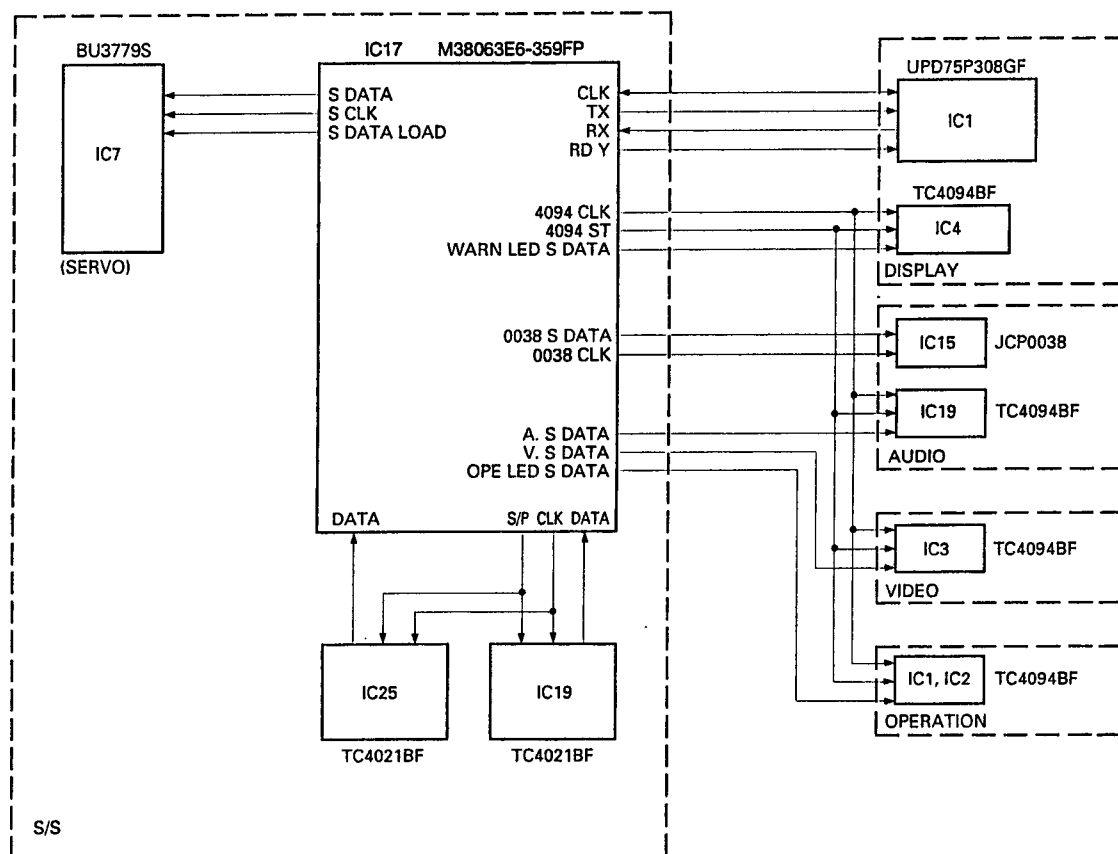


Fig. 7-2-1

2. Syscon CPU

IC17 is an 8-bit single chip microcomputer, which manages and controls VTR mode by means of its output ports. IC1 on the DISPLAY board is a 4-bit single chip microcomputer, which controls time codes for the display indications

by transmitting and receiving signals to/from the syscon CPU synchronizing with the clock. Transmission and reception timing is shown in Fig. 7-2-2 while pin functions of the syscon CPU are shown in Table 7-2-1.

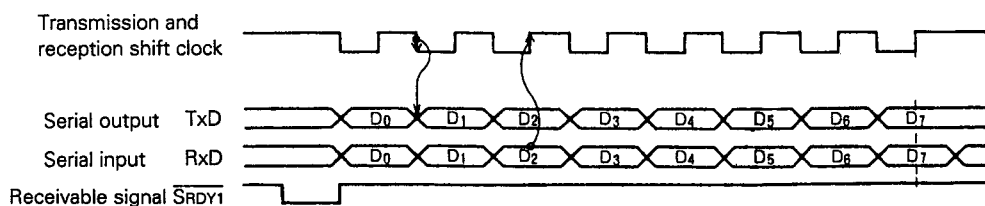


Fig. 7-2-2 Serial transmission and reception timing

● Syscon CPU pin functions

Pin No.	IN/OUT	NAME	DESCRIPTION
1	IN	B	Detection of remaining battery-operated time. BATT WARNING at 10.95 V DC.
2	IN	2.5/5V	Not used in BR-S422
3	IN	CAM ON/STBY	Discrimination between STBY and SAVE1 modes of GY-X2 camera
4	IN	END SENSOR	Not used
5	IN	START SENSOR	End sensor input detected : H
6	IN	TU REEL FG	Start sensor input detected : H
7	IN	SUP REEL FG	TU REEL FG input
8	IN	LCD RDY	SUP REEL FG input
9		LCD CLK	For module communication control of display
10	IN	LCD TX	Microprocessor requests data to display : H
11	OUT	LCD RX	CLOCK
12			TRANS – On detecting L level of RDY signal, S/S transmits/receives
13	OUT	CAP DRV	RECEIVE data to/from display synchronizing with CLK pulse.
14	OUT	A TONE	Not used
15	IN	CAP FG	For driving capstan motor. In modes without servo : DC voltage output (FF, REW)
16		CFP IN	ALARM TONE pulse output
17	IN	OPE COVER OPEN	CAPSTAN FG input
18	IN	CAMERA ON	Not used
19	IN	F. SERVO CTL	Detection of operation cover status. Open : H
20		(Prohibited)	Detection of camera ON/OFF status. ON : L
21	OUT	POWER ON CTL	In REC only. When FRAME SERVO is well-timed : H
22	OUT	VTR STATUS	For display. Control of S/S 5 V and SW 12 V powers.
23	IN	CAMERA COM	VTR STATUS data output to camera
24	IN	PB CTL	Not used. Serial command from camera in GY-X2.
25	IN	DFF	PB CTL pulse input
26		CNV	DRUM FF input
27	IN	RESET	GND
28		REC OUT	RESET input for microprocessor
29	OUT	FULL-E	Not used
30		X IN	Full erase ON/OFF control
31		X OUT	4.9 MHz oscillation block
32		Vss	GND
33	OUT	POWER ON CTL	Not used
34		POWER OFF CTL	Not used
35	OUT	OPE LED S DATA	Serial data output for operation LED
36	OUT	WARN LED S DATA	Serial data output for warning LED
37	IN	DATA IN	Serial data input from TC4021 (IC25)
38	OUT	4021 CLK	CLOCK output to control TC4021 (IC19, IC25)
39	OUT	4021 S/P	Control signal output for TC4021 (IC19, IC25)
40	IN	SW DATA	Serial data input from TC4021 (IC19)
41	IN	JIG	Input port for FULL REPEAT RUNNING mode. (PLAY mode only)
42	IN/OUT	D I/O	Grounding TP7 enters the set in the RUNNING mode.
43	OUT	CS	Data input/output
44	OUT	EEP CLK	CHIP SELECT output – for EEP ROM control
45	OUT	MOTOR CTL	CLOCK output
46	OUT	MOTOR CTL	For control of mode motor (REV)
47	OUT	0038 CLK	For control of mode motor (FWD)
48	OUT	0038 S DATA	CLOCK OUTPUT for control of JCP0038 (IC15) of AUDIO board
49	OUT	4094 STB	DATA OUTPUT for control of JCP0038 (IC15) of AUDIO board
50	OUT	4094 CLK	Control signal output for output booster ICs (TC4094) of AUDIO, VIDEO, DISPLAY, OPERATION boards

Pin No.	IN/OUT	NAME	DESCRIPTION
51	OUT	VIDEO REC	VIDEO CTL signal. In REC mode : H
52	OUT	VIDEO PB	" In PB mode : H
53	OUT	V. REC MUTE	" In REC mode : L
54	OUT	VIDEO S DATA	Serial data output for control of IC (TC4094) of VIDEO board
55	OUT	POWER ON CTL	Power ON/OFF control for SW system
56	OUT	STOP CTL	Control of REC WARNING signal to be sent to camera section
57	OUT	EE (H)	In EE picture output : H
58	OUT	REC WARN	Control of "REC WARNING" (pin 49) of 50-pin output In REC mode : 5 V, In REC PAUSE mode : 2.5 V, In other modes : 0 V 5 V and 2.5 V pulses output when warning happens in REC mode.
59	OUT	BATT WARN	Pulse output in WARNING mode
60	OUT	FLY ON	Flying Erase head control
61	OUT	YNR	Pulse output synchronizing with D. FF in PB mode
62	OUT	ZFE CTL	Control of Zero Frame Editing
63	OUT	A S DATA	Serial data output to control TC4094 of AUDIO board
64	OUT	A REC MUTE	FM audio control signal. In REC mode : L
65	OUT	CAP REV	Capstan rotation direction indication. In REV mode : H
66	OUT	DRUM ON	Drum rotation control
67	OUT	S DATA	Serial data output to control IC (BU3779S) of SERVO board
68	OUT	SERVO DATA LOAD	Control signal output for IC (BU3779S) of SERVO board
69	OUT	PB CTL DUTY	Control of VISS write-in. In Writing : H
70	OUT	S CLK	Serial clock output to control IC (BU3779S) of SERVO board
71	OUT	S MODE	Servo ON/OFF output. When Servo ON : L
72	OUT	CAP POWER UP	When capstan gain goes up : H
73	IN	Vcc	+5 V DC
74	IN	VREF	A/D converter power supply
75		AVss	GND
76	IN	AUDIO R	Signal input for audio level meter (R-ch)
77	IN	AUDIO L	Signal input for audio level meter (L-ch)
78	IN	SW 5 V CK	For SW 5 V check
79	IN	KEY B	Operation key input port. REC/INSERT
80	IN	KEY A	Operation key input port. STOP, REW, FF, PLAY, STILL, EJECT.

Table 7-2-1 System CPU pin function

3. EEPROM (M6M80011AP)

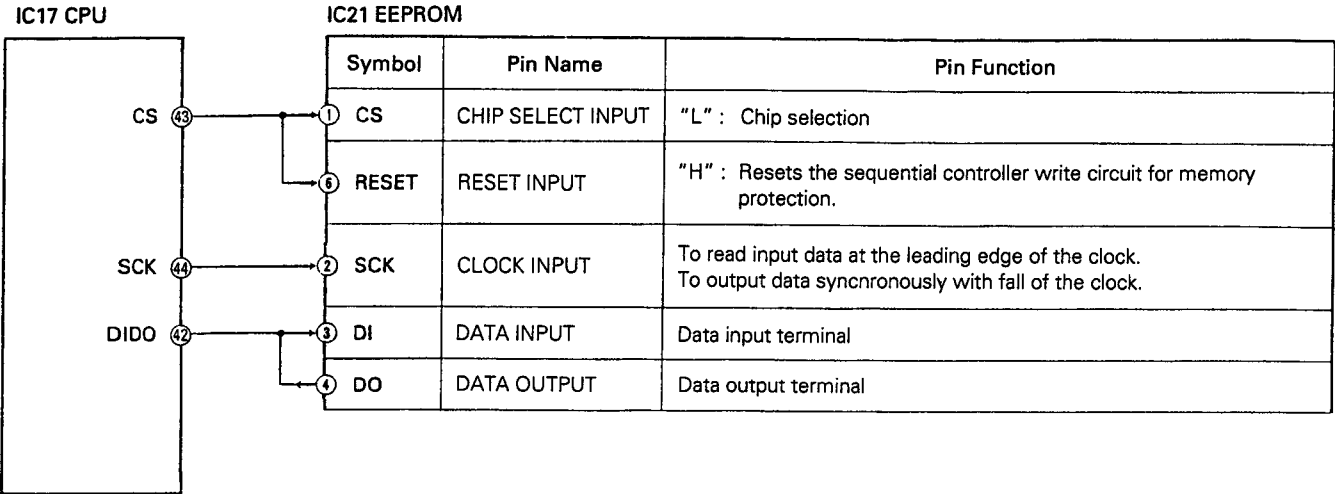


Fig. 7-2-3 IC21 pin functions

● Outline of IC21 functions

IC21 is a 1024-bit (16 bits × 64 words) CMOS EEPROM (Electrically Erasable and Programmable ROM) which is capable of electrically writing and erasing data. This IC which is a clock synchronous serial input and output type records total operation hours of the drum rotation and reads in data at the leading edge of the clock and outputs data synchronously with the fall of the clock.

Each data is divided at a unit of 8 bits, and the first 8-bits unit is used for mode, the second 8-bits is for address and the rest composed of 16 bits is input or output data. The mode can be specified in five ways of WRITE, READ, WRITE ENABLE, WRITE INHIBIT, and STATUS OUTPUT.

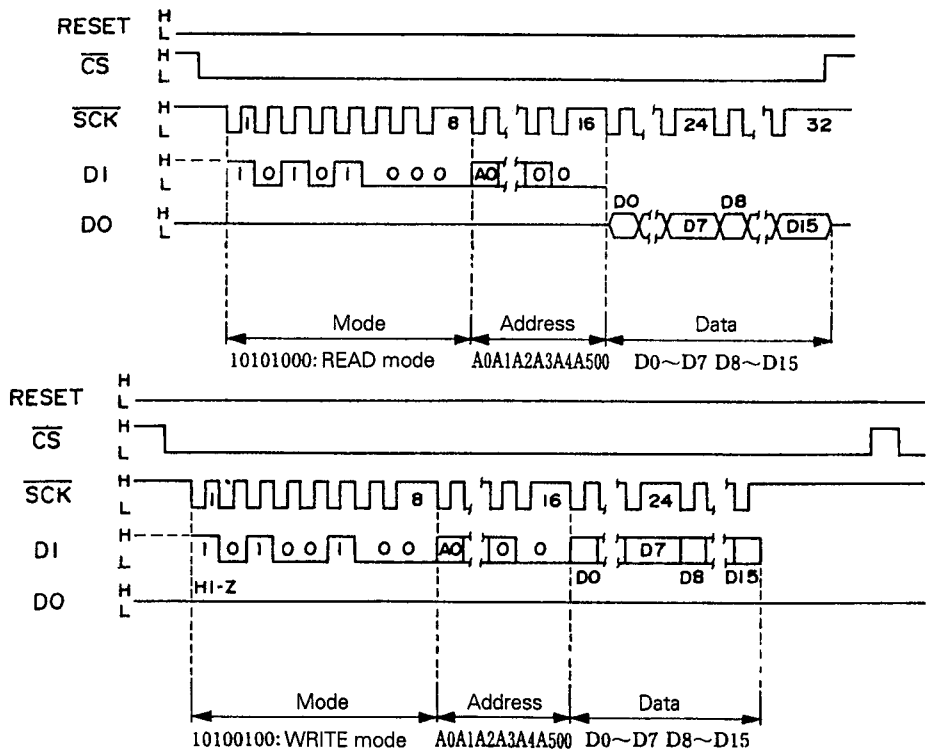


Fig. 7-2-4 READ and WRITE modes timing charts

7.2.2 Servo circuit

1. Block diagram and pin functions Of IC7 (BU3779S)

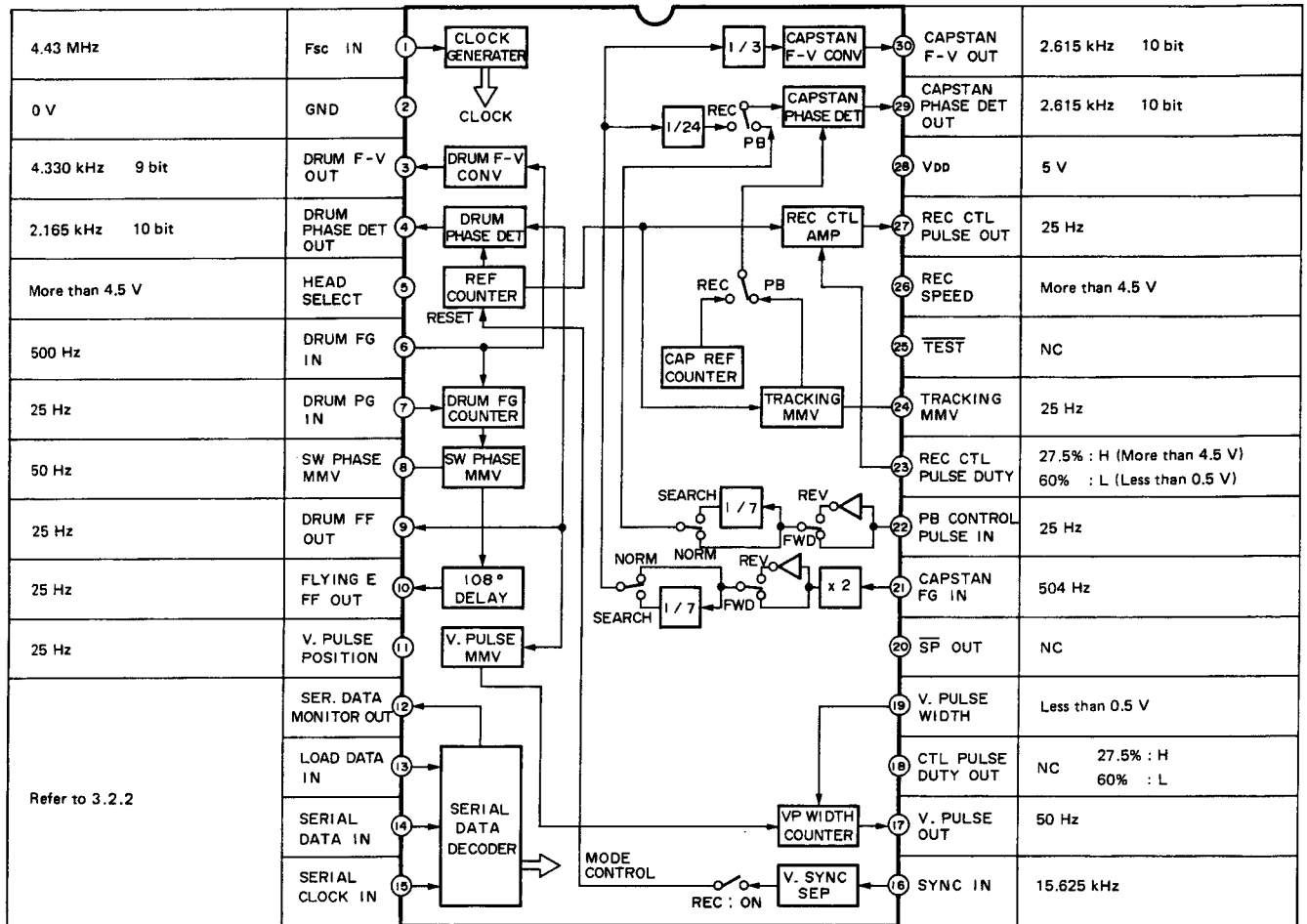


Fig. 7-2-5 Block diagram and pin functions IC7

2. Servo timing chart and data table

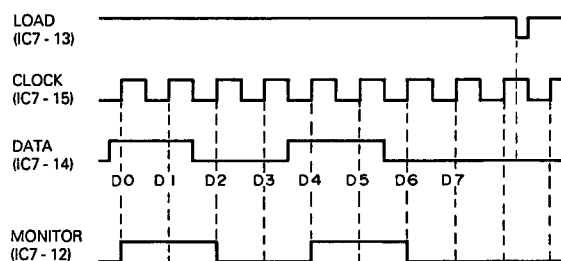


Fig. 7-2-6 Serial data transfer timing chart

Mode	D0	D1	D2	D3	D4	D5	D6	D7
REC	1	1	0	0	X	0	0	0
ASB	1	0	0	0	X	0	0	0
INST	0	1	0	0	X	0	0	0
PB	0	0	0	0	X	0	0	0
REV PB	0	0	1	0	X	1	0	1
SEARCH FWD	0	0	0	1	X	1	1	1
SEARCH REV	0	0	1	1	X	1	1	1

Table 7-2-2 Serial data

Function	Condition & Cause
DRUM PHASE OUT FIX (PWM DUTY: Fixed 50% in cycle)	1. DRUM FG is out of the specified frequency $\pm 5\%$, approx. 2. In SEARCH, STILL, REV PB
CAP PHASE OUT FIX (PWM DUTY: Fixed 50% in cycle)	1. DRUM FG is out of $\pm 1.0\%$ tolerance of the specified frequency for the NOR operation. (CAP FV OUT: 'H' at this time) 2. CAP FG is out of the specified frequency $\pm 5\%$, approx. 3. Dropout of CTL PULSE (other than in REC) 4. In FF/REW

Table 7-2-3 Special functions

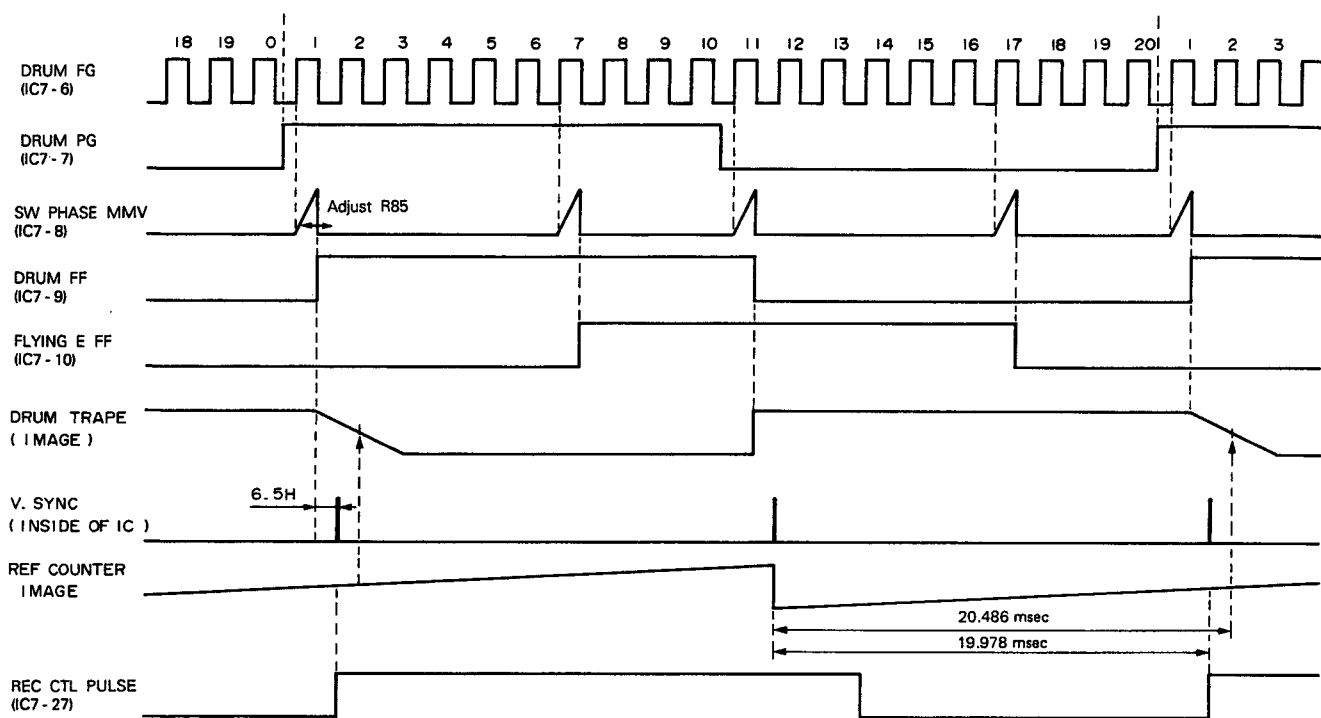


Fig. 7-2-7 Drum servo timing chart

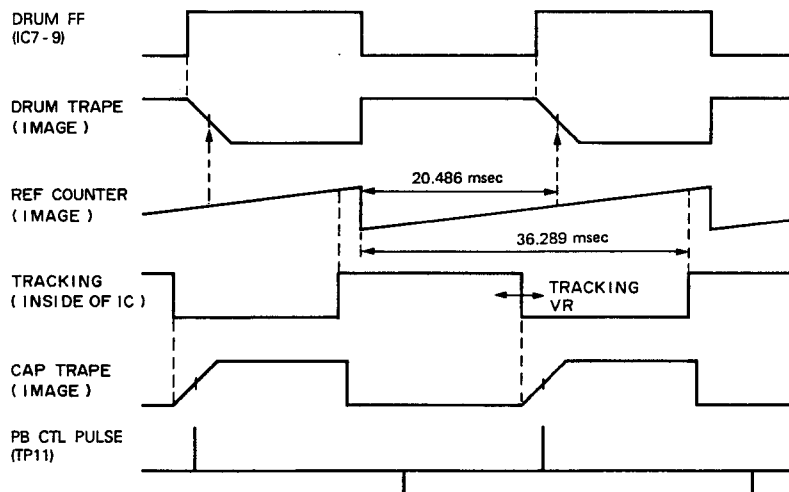


Fig. 7-2-8 Playback servo timing chart

3. Zero frame editing

In this model the duty of the CTL pulse is controlled for smooth splicing of pictures in the zero frame editing. At the end of a recording ZFE (ZERO FRAME EDIT) pulse is written

on the tape and it will be read out at the editing point in the preroll operation in order to continue pictures before and after the editing point smoothly.

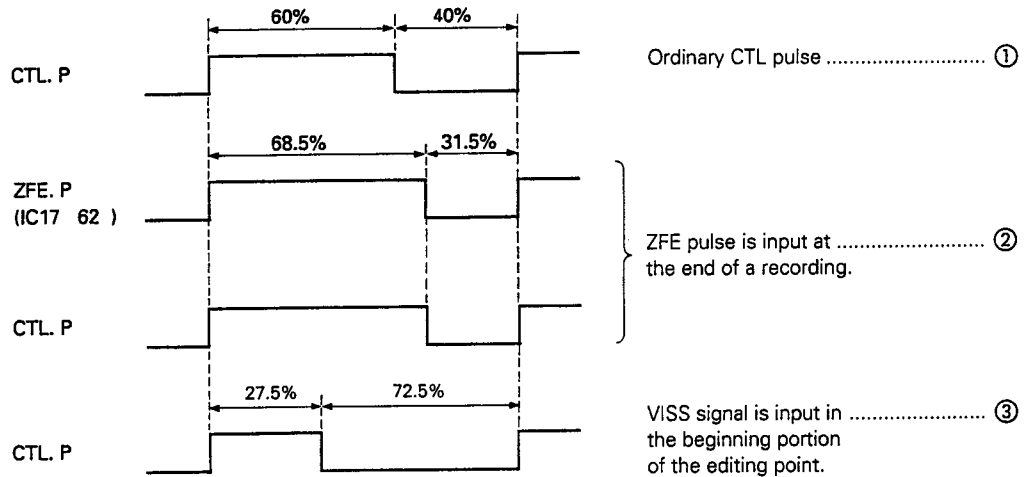


Fig. 7-2-9 CTL pulse duty

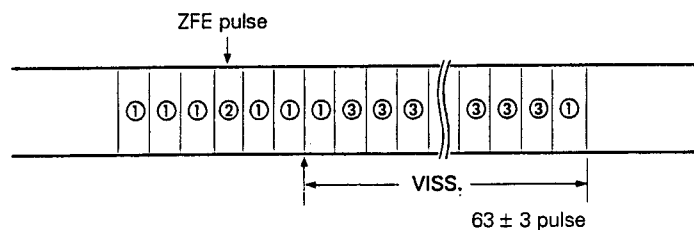


Fig. 7-2-10 Edit mode control pulse

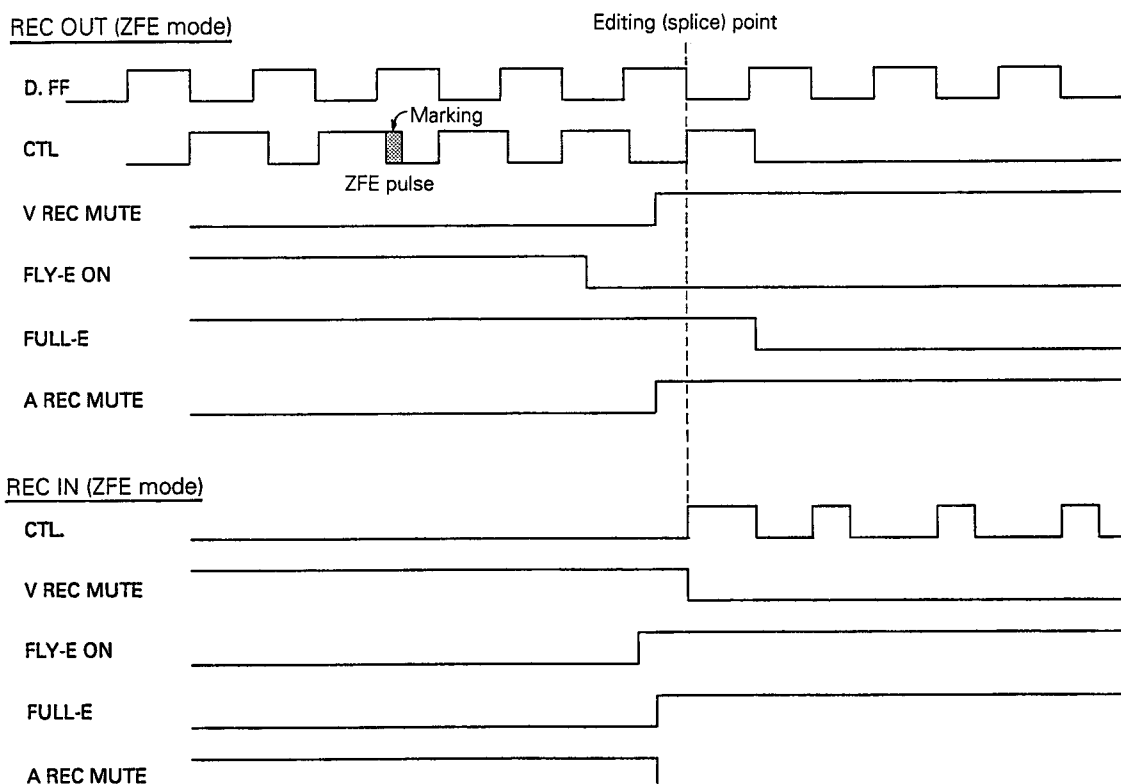


Fig. 7-2-11 Blanking switch timing

4. Control of frame servo

In recording the frame servo is controlled by controlling the DRUM PHASE DET signal (IC7 pin ④).
V. sync signal that underwent synchronizing separation is input to IC12 of the S/S board. IC12 is a frame detector, which generates FIELD FF waveform.

The phase of the FIELD FF is compared with that of the DRUM FF by IC501. When the phase of the FIELD FF is in advance of the DRUM FF's phase, IC501 pin ① outputs "H" to IC502, while it outputs "L" when the DRUM FF advances in the phase.

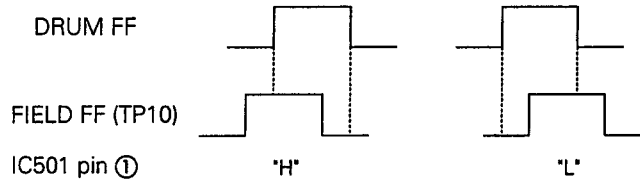


Fig. 7-2-12

IC404, IC402, IC403 detect whether the frame servo is locked or not in order to change over the switch of IC502, namely, when the frame servo is locked, "H" is output from TP3, while "L" is output when it is not locked.

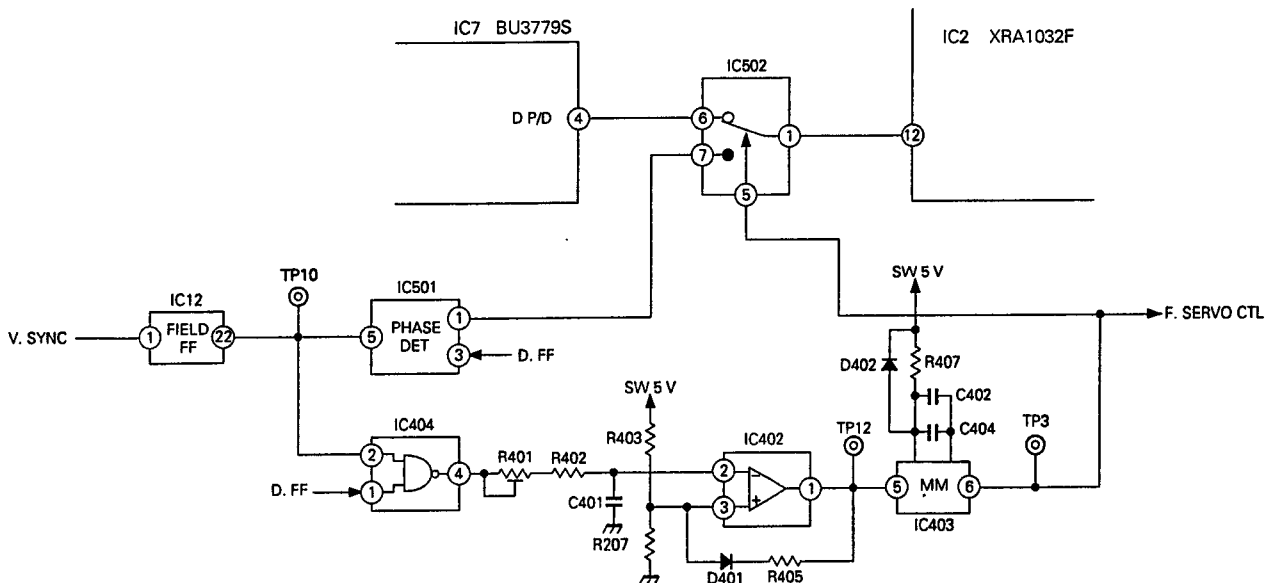


Fig. 7-2-13 Frame servo circuit

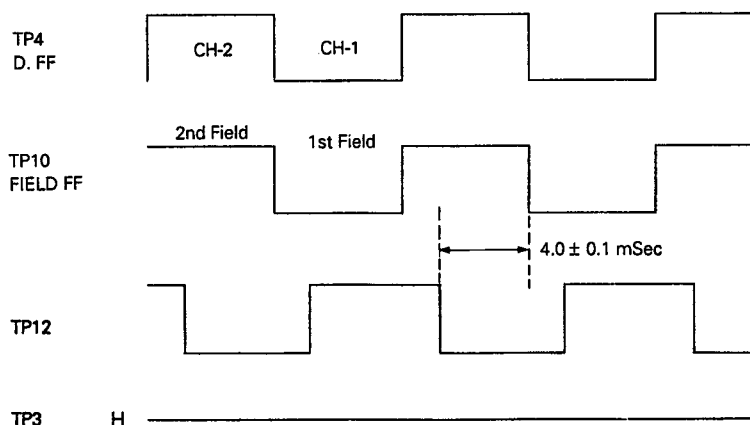


Fig. 7-2-14 Timing chart when frame servo is locked

7.3 VIDEO CIRCUIT

1. VITC MIX circuit

When the TIME CODE board is incorporated in the VTR, this circuit mixes VITC (Vertical Interval Time Code) signal in the V. blanking period. One line comprises of 90 bits and the signal is mixed in two lines of the 19H and 21H lines in the initial setting mode.

2. AUTO EQ MIX circuit

This circuit mixes reference signal supplied from the AUTO EQ board. In the initial setting, reference signal is mixed in 11 lines only in the S-VHS mode.

● Outline of AUTO EQ circuit

The AUTO EQ circuit is installed to prevent frequency response from deterioration caused by demagnetization of tape and to control irregularity in respective frequency characteristics of tapes used. Two reference signals of 625 kHz and 3.8 MHz are recorded in optional lines in the V. blanking period, and the video equalizer is controlled in playback to equalize PB level of each reference signal with that of the original. Accordingly, the frequency response is automatically adjusted in the S-VHS mode.

This VTR is designed to be used as a recorder, therefore, it adds reference signal but has not equipped with any automatic PB adjusting circuit. In case of the BR-S822E, it gets AUTO EQ reference signal blank in video output, however, the BR-S422E does not blank the reference signal and outputs it as it is added.

● Reference signal generator circuit

Reference signals are generated by the gate array IC (IC1, JCL0009). This IC receives 4 fsc clock through the pin ⑥ while it receives sync. signal through the pin ②⑩, and it outputs 625 kHz reference signal through the pin ⑬ while 3.8 MHz reference signal through the pin ⑫. These reference signals are supplied to the LPF and BPF circuits which mix them to be output as the reference signal synchronizing with the sync. signal.

Pins ③, ④ and ⑤ function to control the reference signal insertion line which is selected by SW1. In detail, line selection is performed by SW1-2, SW1-3 and SW1-4, and, when all of them are on, nothing is selected for insertion. If SW1-1 is off, the SW 5V signal line of the circuit is cut off, therefore insertion is not activated without change of the insertion lines set by SW1-2, -3 and -4.

R29 and R38 are variable resistors to adjust reference signal level so that the ratio between sync. level, 3.8 MHz level and 625 kHz level becomes 4 : 2.0 : 4.0 since this VTR has not the playback circuit for automatic level adjustment. (For a reference, the BR-S822E records sweep signal and plays it back to obtain the specific frequency response.) The above-mentioned ratio is determined to obtain the specific frequency response on the condition that the BR-S422E is used for recording and the BR-S822E for playback.

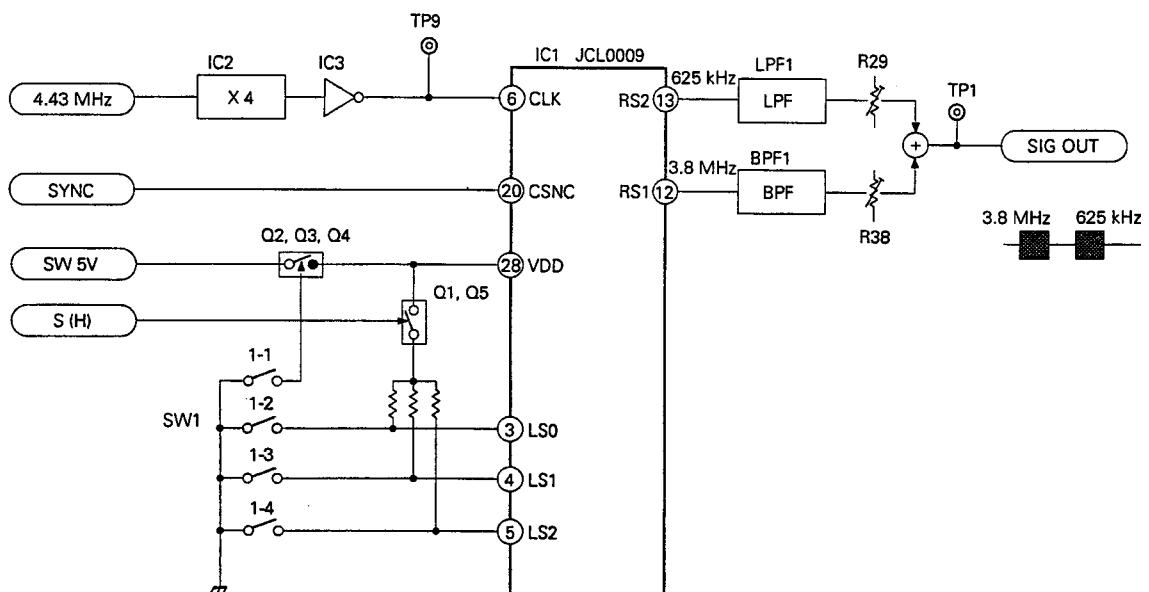


Fig. 7-3-1

3. Edge enhancer/noise canceller circuit (with sue of advanced limiter)

The circuit shown in Fig. 7-3-3 is the new edge enhancer (in recording) and the noise canceller (in playback) circuit that incorporates the advanced limiter inside.

The advance limiter circuit realizes the input/output characteristic shown in Fig. 7-3-2 by combining a differential amp. (IC11) and a limiter (IC12).

As the edge enhancer, this circuit hardly influences the frequency response of comparatively high amplitude signal. Therefore, enhancement in thin and light portions is visually the same as the effect of ordinary detail enhancers without emphasis in high amplitude portions, and picture is consequently natural.

As the noise canceller, it does not deteriorate high amplitude signal in the frequency response since it takes reverse operation of the edge enhancer. As a result, this circuit performs clear edge enhancement without getting picture unsightly owing to its function to cancel low level noise only.

● Edge enhancer circuit

In recording this circuit is supplied with luminance signal of 1.5 Vp-p. At that time, Q85 is off and Q84 is on since the level of PB(H) signal is "L". Therefore, the differential amp. inside the advance limiter circuit and the LPF circuit composed of C95 and R242 construct an HPF circuit whose cutoff frequency is 1 MHz. Inside the limiter circuit, only the low level components of the output of the HPF are output in the same phase as that of the input signal. Finally, this output is mixed with luminance signal that is delayed for the delay time (50 ns) of the limiter circuit, therefore, the circuit functions as the edge enhancer circuit.

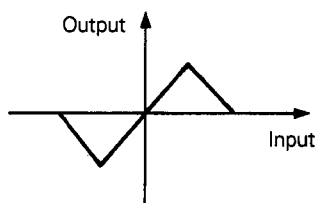


Fig. 7-3-2

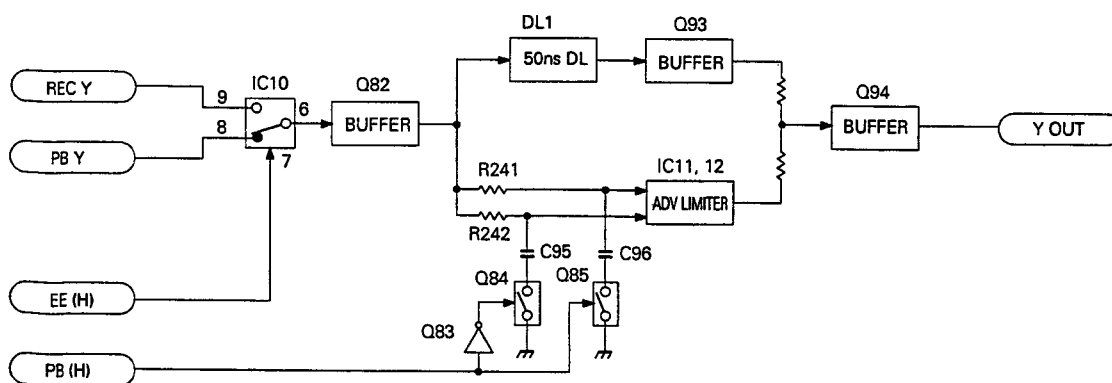


Fig. 7-3-3 Edge enhancer/noise canceller circuit

● Noise canceller circuit

In playback this circuit is supplied with luminance signal of 2.0 Vp-p. At that time, Q84 is off and Q85 is on since the level of PB(H) signal is "H". Therefore, the LPF circuit composed of C96 and R241 and the differential amp. inside the advance limiter circuit function as the HPF circuit as same as it functions as the edge enhancer circuit. However, output of the HPF circuit has the reverse phase of that in the condition of the edge enhancer circuit, and the output of the limiter circuit consequently has the reverse phase of the input signal. As a result, the circuit functions as the noise canceller circuit.

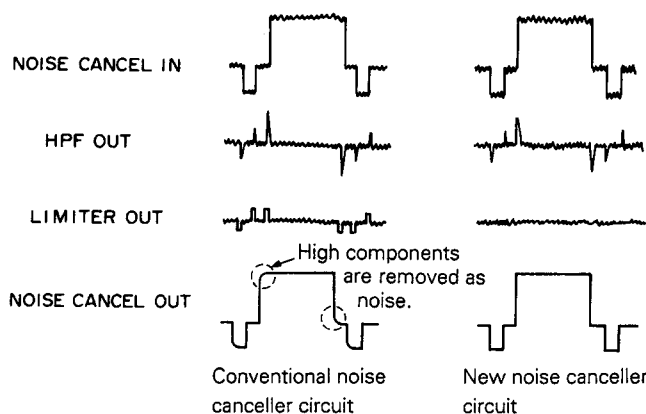
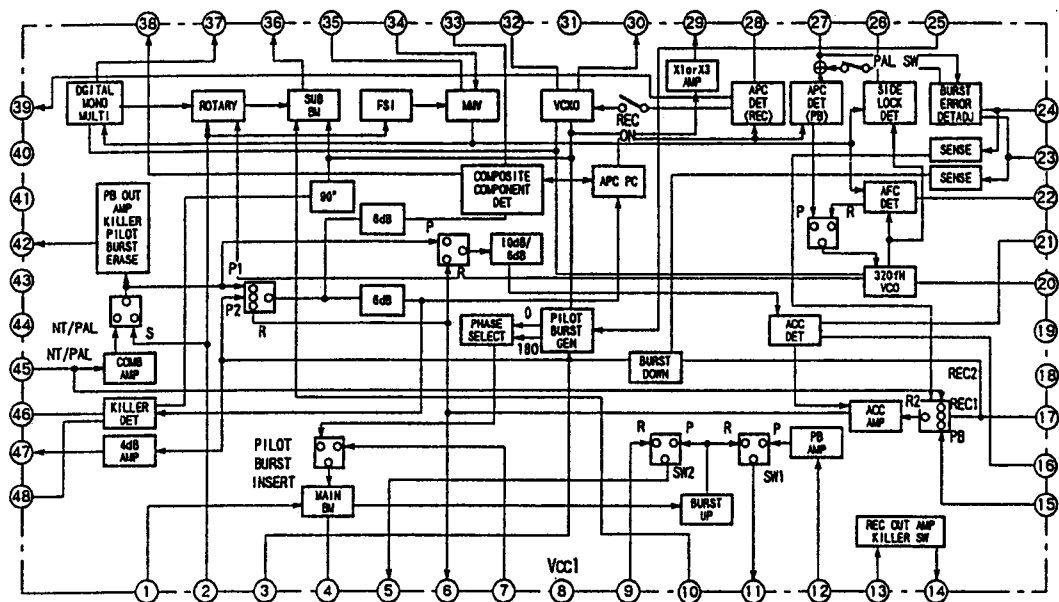


Fig. 7-3-4 Noise canceller circuit

4. Color signal system

IC26 (M52062AFP) is the chrominance signal processing circuit which the main/sub balanced modulator, VCXO, 321 fh VCO, ACC, chroma ACC, APC, AFC, killer circuit, side lock detecting pilot burst insertion/erasure circuit, and pilot APC circuit are built in.



PIN No.	Description	PIN No.	Description
1	MAIN BM IN	25	PILOT BURST GAIN ADJ
2	ROTARY SW IN	26	SIDE LOCK DET
3	PILOT BURST PHASE ADJ	27	PB APC FILTER
4	MAIN BM BYPASS	28	REC APC FILTER
5	SW2 OUT	29	VCXO OUT1
6	ACC OUT	30	VCXO OUT2
7	ACC IN	31	Vcc2
8	Vcc1	32	VCXO IN
9	REC CHROMA IN	33	PILOT BURST DET FILTER
10	SUB BM BYPASS	34	Hss IN
11	SW1 OUT	35	MMV TIMING
12	PB LOW CHROMA IN	36	SUB BM OUT
13	REC OUT AMP IN	37	HP OUT
14	REC LOW CHROMA OUT	38	PILOT BURST DET OUT
15	PB ACC IN	39	BURST ERROR OUT
16	CHROMA ACC FILTER	40	2/4/6 SW IN
17	REC ACC IN	41	R/T/P SW IN
18	P/S/N SW IN	42	PO OUT AMP OUT
19	GND	43	CPS/CPN/VHS SW IN
20	VCO ADJUST	44	GND
21	BURST ACC FILTER	45	COMB AMP IN
22	REC AFC FILTER	46	KILLER REF
23	BURST ADJUST	47	COMB DRIVE OUT
24	BURST ERROR DET	48	KILLER FILTER

Fig. 7-3-5

• ALU circuit

Besides the burst ACC, IC26 incorporates the ALU circuit as the chroma ACC inside, and chroma signal whose low frequency has been converted is input through pin ⑬ to activate ALU function.

The ALU circuit functions to improve S/N ratio of low level color signal. The principle of the function is as follows. In recording low level color signal is amplified by this circuit together with burst signal. When this signal is played back, the amplified low level component is returned to the original level with reduced noise components by the ACC circuit (functioning to stabilize burst level) and improved S/N ratio.

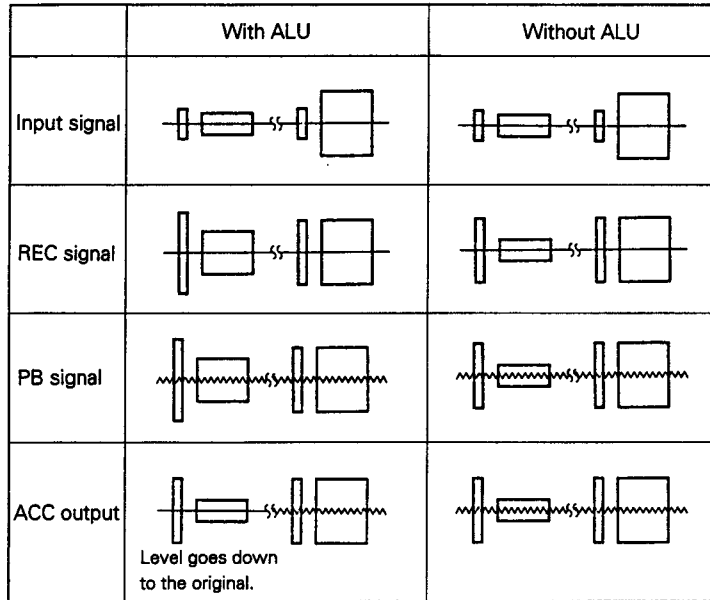


Fig. 7-3-6 Principle of ALU circuit

5. Outline of CNR circuit (IC23)

The CNR circuit removes random noise contained in PB color signal and the IC BA7233 is used for this circuit as well as other models. Since this circuit removes noise components by arithmetic processing of PB color signal and the signal 1H before, malfunction may occurs in portions without line correlation and it causes vertical blurring in color. To prevent this problem, non-correlative pulse that is obtained from luminance signal is used to turn off the CNR circuit for the portions without line correlation. Moreover, the CNR circuit is turned off in the Edit mode.

relation and it causes vertical blurring in color. To prevent this problem, non-correlative pulse that is obtained from luminance signal is used to turn off the CNR circuit for the portions without line correlation. Moreover, the CNR circuit is turned off in the Edit mode.

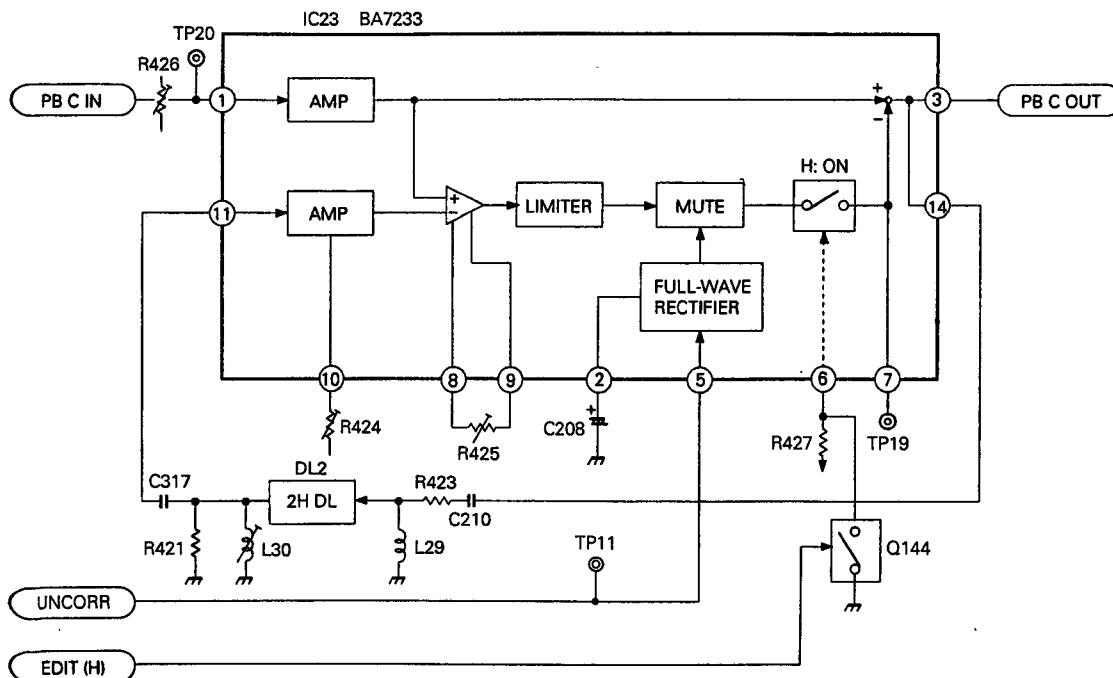


Fig. 7-3-7 CNR circuit

7.4 AUDIO CIRCUIT

● GENERAL DESCRIPTION

The BR-S422E is a VTR capacitated for 2-channel audio recording on the normal track and the Hi-Fi track.

The specifications of the input and output circuits are described below.

7.4.1 Input and output systems

1. 50-pin multi-connector
 - Balanced input
 - High impedance (10 k Ω approx.)
 - Input sensitivity : -20 dBs
2. EXT. MIC terminal
 - Balanced input
 - High impedance (10 k Ω approx.)
 - Input sensitivity: +4 dBs (10 k Ω)/-60 dBs (3 k Ω)
3. Input attenuator (for MIC input only)
 - ± 10 dB to -60 dB of the EXT. MIC terminal, settable with the internal switch.
4. Limiter characteristic
 - The limiter is activated when the level is +13 dB compared with 0 VU of the reference level, and the limiting range is extendable up to +26 dB.
5. Camera MIC amplifier circuit
 - Balanced audio signal input through the 50-pin connector is converted into unbalanced audio signal by IC1.

All of input levels are shown in Fig. 7-4-1, which illustrates how respective input levels changes. When input from the 50-pin connector has -20 dBs level, its level is dropped to -30 dBs by the -10 dB amplifier first and then the signal is connected to the switch. At the same time, the signal is transformed from the unbalanced signal to the balanced signal. The amplifier having -10 dB gain is IC1, which has the dynamic range of +38 dB enough for the clipping level at the amplifier's output point as compared with the -20 dB input of the reference level.

6. MIC amplifier circuit

- In case of mic input, -60 dBs input of the reference level is amplified to -30 dBs by the +30 dB amplifier. The feedback level of this amplifier is variable by additional +10 dB or -10 dB with switch setting, and this variable function is used as the input attenuator. This amplifier is good at the S/N ratio and has 40 dB head room in the gain-up condition up to +10 dB clipping output level.

The input selector switch (CAM/LINE) in the next stage is switched with the external XLR input by the AUDIO INPUT SELECT switch inside the side panel. In consideration of monaural input from the camera mic, setting of the switch to the CH1 position makes it possible to record camera mic input on the CH2 in addition to the same recording on the CH1.

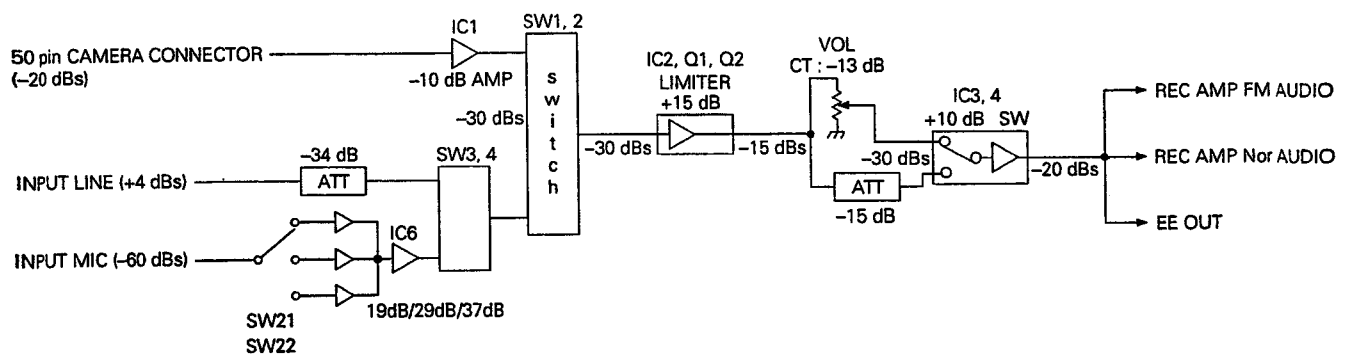


Fig. 7-4-1 Input level diagram

7. Limiter amplifier circuit

- The limiter amplifier (IC2) that is newly employed in the BR-S422 functions to record over-level input without distortion, therefore, it is activated only when input has excessively over-level and has not gain adjustment function for low level input. The standard output level of this limiter amplifier is -15 dBs, and it automatically controls output level not to exceed the standard level and + 6 dB at maximum.

IC2 is an operational amplifier whose gain is determined by R14 and R13. The gain G is generally expressed by the following equation.

$$G = 1 + (R13/R14) = 1 + 220 \text{ k}\Omega/47 \text{ k}\Omega = 5.68 \text{ times} = 15 \text{ dB.}$$

However, there is the attenuator circuit composed of R11 and R32 in the input circuit, therefore, the circuit composed of Q2 FET and R25 connected in parallel is connected with R32 in series. As a result, the attenuator continuously varies attenuation level up to -26 dB according to the resistance of Q2 when Q2's level is in the range between -0.1 dB and the full capacity.

When a DC voltage which is higher than the specific DC voltage (4 V) determined by R33 and R34 and rectified by D6 is applied to Q2, resistance between the drain and the source declines and the attenuator starts operation to decrease the input level of the IC (see Fig. 7-4-2).

In the same manner, DC voltage rectified by D10 is impressed to Q2 in order to prevent over-modulation by monitoring the output level that is logarithmically compressed to 6 dB at frequency modulation.

This loop circuit has the time constant determined by C16, R19 and R20, and the attack time and the recover time are 0.85 msec and 4 sec respectively, which are convenient for smooth operation of the VTR.

Moreover, output of D14 is supplied to the limiter circuit, too, and this signal is added with muting pulse that is generated when Q8 and Q9 get SW 9V and SAVE 9V pulses to rise for the purpose of preventing recording signal from getting noise mixing.

8. REC level adjuster circuit

- Output of IC2 is attenuated by -15 dB by R35 and R36 when the REC LEVEL switch inside the side panel is set to FIX. When this switch is set to the MANUAL, recording level can be adjusted by the AUDIO REC LEVEL VR on the side panel.

The setting of the REC LEVEL switch to the FIX position is useful in emergency since the level is nearly equal to the level when the volume is set to the mid point.

IC3 which incorporates an analog switch capable of selecting adjusting signal inside functions to control recording level so that it inputs signal supplied to pin ⑦ from between two signals supplied to pins ⑦ and ② when the pin ① has "H" level. The "L" level of pin ① is not 0 V but about 4.5 V equivalent to 1/2 Vcc for the reason of the linearity of the amplifier, and "L" level is supplied by R167 connected with the collector of the transistor switch Q44. The signal whose level is adjusted as mentioned above is supplied to the normal recording amp (IC16) and the Hi-Fi recording amp (IC15). IC10 adjusts the signal level to be the reference PB level (-6 dBs) by R128, and the signal is output as EE output signal from the AUDIO-1 terminal.

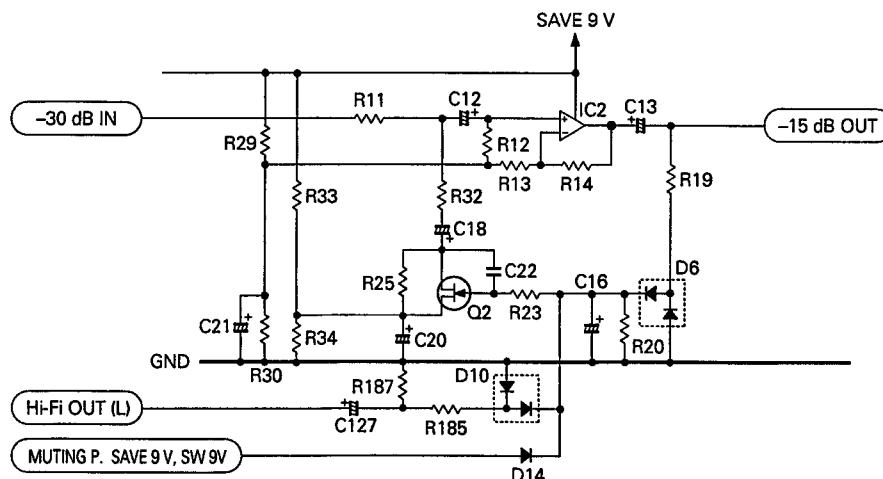


Fig. 7-4-2 Limiter circuit (L-ch)

9. Change of line level (from +4 dBs to -20 dBs)

- The XLR external input connector is switchable for MIC input or LINE input by switching the -60 dBs/+4 dBs sensitivity selector switch. Comparing with the BR-S411E which has the -20 dBs external input selector switch, the BR-S422E removes this selector since its function is seldom used. If 10 dB attenuator is used for the -60 dBs setting, the sensitivity is -50 dBs that is still too high and useless for actual recording. Therefore, it may be necessary to change the sensitivity to -20 dBs with the +4 dBs setting. In this case, it is suggested to change the attenuator level to -10 dB from the present -34 dB. To obtain the required sensitivity, replace R62 (180 Ω) that determines the attenuation level with a 3.3 k Ω resistor.

10. Monitor output circuit

- IC12 of the analog switch selects monitor signal, and Hi-Fi or NORM PB audio output can be selected with the MONITOR OUT switch on the operation panel. The selection function of this IC is activated only in the playback mode.

IC10 and IC11 function to output EE audio signal with the SAVE 9 V activated even when power supply of the switch system is off. Namely, the SAVE 9 V has the same function as the switch system in the BR-S422E.

Signal output from pin ⑤ is supplied through the muting circuit of Q6 and the MOTHER board to the RCA pin terminal on the CONNECTOR board, and it is output from the connector. On the other hand, the signal from pin ⑥ is also supplied to IC13 and IC18 as the meter indication signal and the output signal for the headphone.

Q39 and Q40 function as the switch circuit. When Q3 is off in the MIX mode selected by the MONITOR OUT switch on the subpanel, mixture of CH1 and CH2 signals is output as the headphone signal. When Q40 is turned off by the switch, signal on one channel is selected to output.

Alarm signal output from the headphone is generated by mixing the alarm tone signal that is output from IC17 of the CPU in emergency and at the tape end after level setting by R120 of the MONITOR LEVEL control.

Q10 and Q11 suppress generation of phut noise generated when the mode is shifted to the playback.

7.4.2 Hi-Fi audio recording system

IC15 is the Hi-Fi audio recording amp. whose pin 84 is used for signal input and its reference input level is -20 dBs. This IC is equipped with an internal AGC gain amp. but it has no gain as 0 dB since pin ③ is of 0 Ω .

After mode is shifted from REC to PB, the LPF limits frequencies higher than 20 kHz and drives the PNR (Peak Noise Reduction) circuit. Regarding this circuit brief explanation appears in the following since there are detailed explanations in many instructions of other models.

In the Hi-Fi recording system of the VHS format, the frequencies of two carriers of CH1 (1.4 MHz) and CH2 (1.8 MHz) are modulated in the range of ± 50 kHz, and the FM signals are recorded on the video track by the Hi-Fi REC head.

To obtain sufficient dynamic range with a low f/c ratio (ratio between frequency deviation and carrier frequency), 2:1 logarithmic compression is applied in the periods of 240 μ sec and 24 μ sec (663 Hz to 6631 Hz) for bottom-up recording at the level of 6 dB/oct. Those operations are performed by the VCA, PEAK DET and WEIGHTING circuit connected with pins ⑧, ⑨ and ⑩ respectively.

The pre-emphasis circuit which is installed to prevent deterioration in S/N ratio caused by so-called triangular noise that frequently occurs in the FM recording system emphasize high frequencies of 56 μ sec and 20 μ sec (2842 Hz to 7958 Hz) by the level of 6 dB/oct.

The VCO circuit applies frequency modulation to carriers, and there is a limiter circuit used for preventing over-modulation not to exceed the utmost modulation limit of ± 150 kHz. The LPF which is installed in the previous stage of pin 21 to output signal prevents video signal from getting undesirable influence of higher harmonic distortion.

IC15 has the command demodulation circuit, which converts serial command from the syscon into parallel data together with IC19 to control the audio circuit.

7.4.3 Normal audio system

1. IC16, IC17 (LA7285M)

The LA7285M incorporates the LINE amp, REC amp, PB amp and the limiter circuit inside.

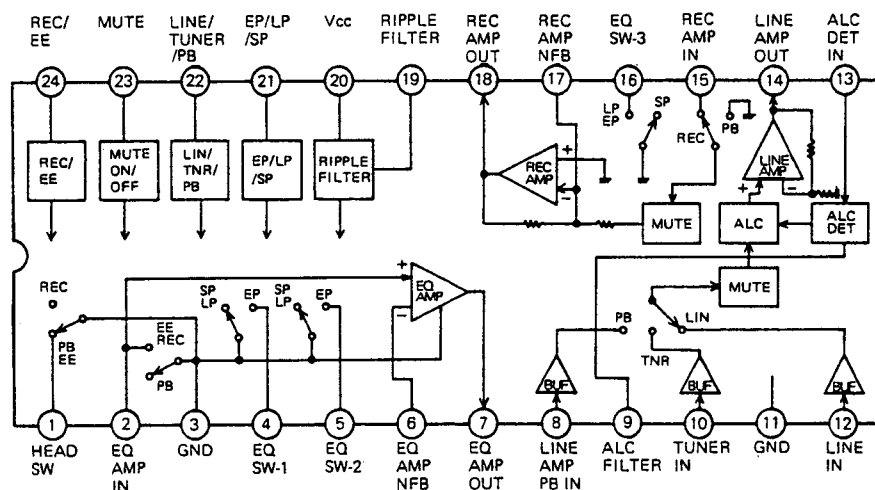


Fig. 7-4-3 Block diagram

● Pin functions

Pin No.	Name	Function						
1	HEAD SW 1	ON : EE and PB modes, OFF : REC modes						
2	EQ AMP INPUT and HEAD SW 2	PB signal input from audio head ON : EE and REC modes, OFF : PB mode						
3	GND	Ground for exclusive use of head switch of pin ①, EQ amp. and PB EP switch						
4	EP SW 1	Not used						
5	EQ SW 2	Not used						
6	EQ AMP NFB	To apply negative feedback for demonstrating equalizer characteristic						
7	EQ AMP OUTPUT							
8	LINE AMP PB INPUT	PB signal input from EQ amp.						
9	ALC FILTER	Detection and setting of attack time and recovery time according to the time constant of CR.						
10	TUNER INPUT	CH2 for input of time code signal (LTC)						
11	GND	Ground for circuits and blocks except head switch and EQ amp circuit						
12	LINE INPUT	EE, REC signal input						
13	ALC DETECTION INPUT	ALC level is determined by attenuation by R255, R256 (CH1) and R285, R286 (CH2).						
14	LINE AMP OUTPUT							
15	REC AMP INPUT	Recording current is set by R254 (CH1) and R284 (CH2). REC amp. is inversionsal amp.						
16	LP SW	Not used						
17	REC AMP NFB	To boost high frequency response depending on L, C, R connected.						
18	REC AMP OUTPUT							
19	RIPPLE FILTER							
20	POWER SUPPLY (Vcc)	To remove ripple with capacitor						
21	EP/LP/SP CONTROL	<table border="1"> <tr> <td>H</td><td>M</td><td>L</td></tr> <tr> <td>EP</td><td>LP</td><td>SP</td></tr> </table>	H	M	L	EP	LP	SP
H	M	L						
EP	LP	SP						
22	LINE TUNER PB CONTROL	<table border="1"> <tr> <td>LINE</td><td>TUNER</td><td>PB</td></tr> </table>	LINE	TUNER	PB			
LINE	TUNER	PB						
23	MUTE CONTROL	<table border="1"> <tr> <td>MUTE</td><td>—</td><td>MUTE</td></tr> <tr> <td>ON</td><td>—</td><td>OFF</td></tr> </table>	MUTE	—	MUTE	ON	—	OFF
MUTE	—	MUTE						
ON	—	OFF						
24	REC/EE CONTROL	<table border="1"> <tr> <td>EE</td><td>—</td><td>REC</td></tr> </table>	EE	—	REC			
EE	—	REC						

Table 7-4-1

2. IC18 (CXA1102M)

IC18 is the 2-channel Dolby B type noise reduction circuit. Its encoding characteristic is shown in Fig. 7-4-4.

Pin ⑤ switches NR on/off.

"H" : NR OFF, "L" : NR ON

Pin ⑫ switches REC/PB.

"H" : PB (decoding), "L" : REC (encoding)

3. REC amp circuit

The REC amp circuit includes the low boost circuit composed of C208, C209, C210, R259, R260 and R261, and the REC amp. of IC16 to compensate high component loss in recording and playback. This circuit has a high boost equalizing characteristic which is shown in Fig. 7-4-5.

4. PB equalizer

Normal audio output from the A/C head is supplied to IC16 through pin ② (L-ch) and amplified by the PB amp inside the IC. This IC applies negative feedback to the signal so as to function as the PB equalizer amp. The frequency characteristic of this PB equalizer amp is shown in Fig. 7-4-6.

Signal input through pin ⑦ is supplied to R271 to adjust the PB level and again input from pin ⑧. After that, signal flow is the same as in recording.

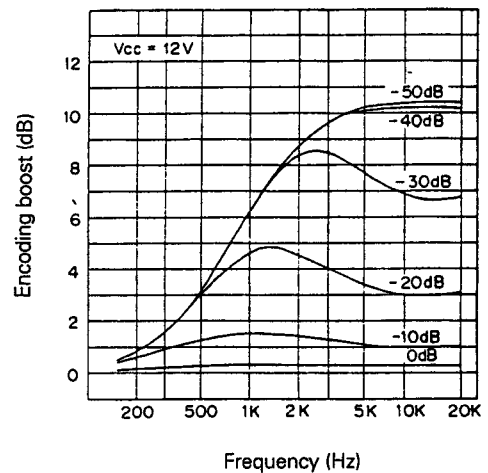


Fig. 7-4-4 Encoding characteristic

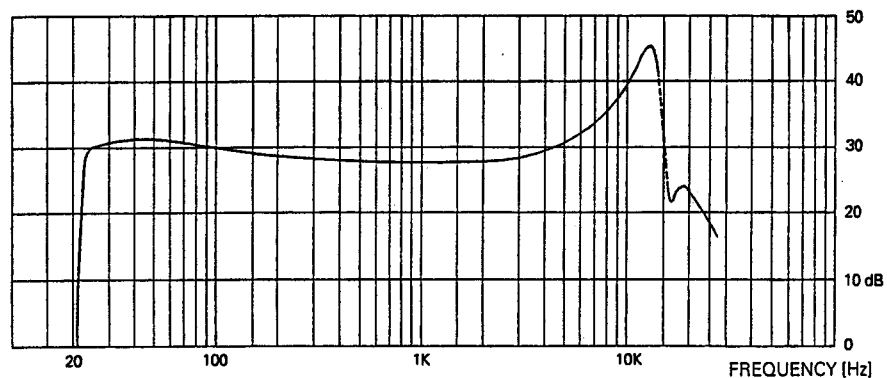


Fig. 7-4-5 Recording frequency response

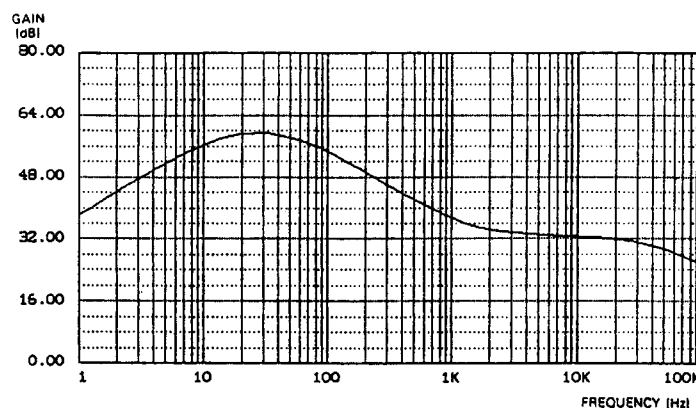


Fig. 7-4-6 Frequency response of PB EQ amp.

7.5 MECHANISM OPERATION

7.5.1 Function of motors

1. Drum motor

The drum motor composed of a stator and rotor inside the lower drum drives the upper drum to which video heads are attached.

2. Capstan motor

The capstan motor forwards and rewinds the tape by rotating in the normal and reverse directions.

1. By normal rotation of the capstan motor the take-up gear comes to the TU (take-up) side.

In the PB (playback) mode, rotation of the capstan motor is transmitted to the take-up reel disk via the clutch mechanism.

2. By reverse rotation of the capstan motor the take-up gear comes to the SUP (supply) side.

In the REV (Reverse; Search REW) mode, the clutch mechanism transmits rotation of the capstan motor to the supply reel disk.

3. By normal rotation of the capstan motor the take-up idler which is in contact with the pulley gear comes to the TU side.

In the FF (Fast Forward) mode, rotation of the capstan motor is directly transmitted to the take-up reel disk. (See Fig. 7-5-2.)

4. When the capstan motor rotates reversely, the take-up idler comes to the SUP side.

In the REW (Rewind) mode, rotation of the capstan motor is directly transmitted to the supply reel disk.

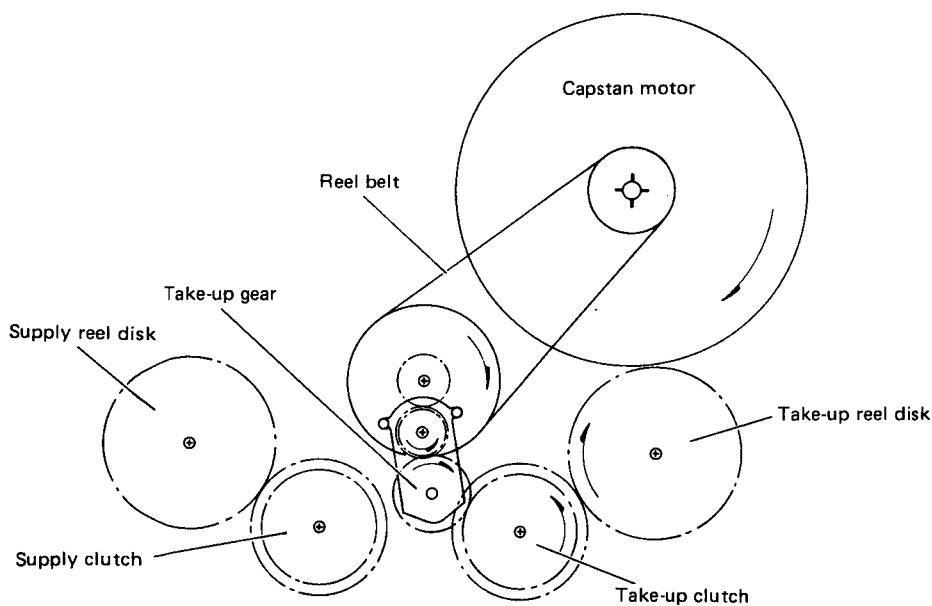


Fig. 7-5-1 Capstan motor's function (in PB mode)

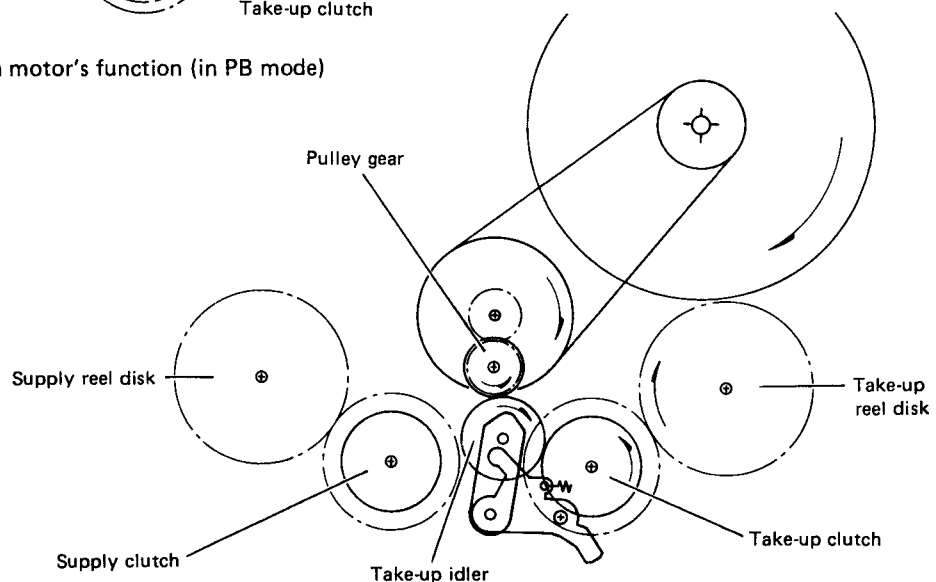


Fig. 7-5-2 Capstan motor's function (in FF mode)

3. Mode control motor

The mode control motor rotates in the normal or reverse direction to move the control cam which shifts component parts for the selected mode.

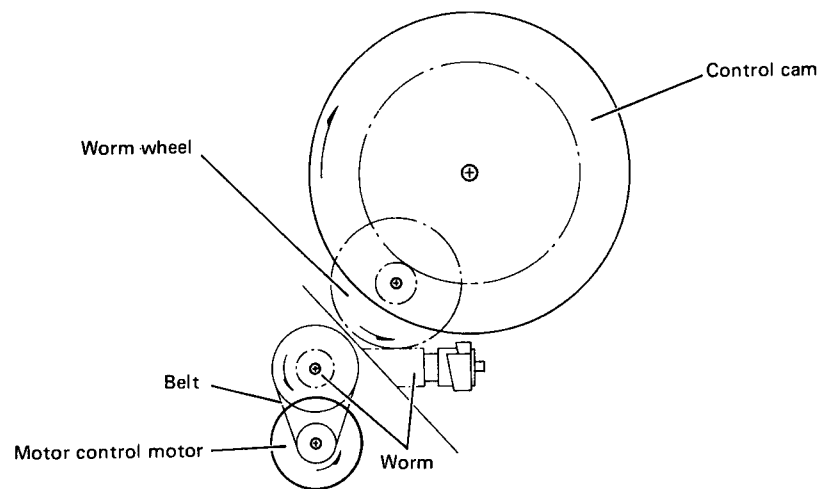


Fig. 7-5-3 Mode control motor's function (in Loading direction)

7.5.2 Mode shift

The control cam changes its position appropriately for shifting the component parts so that they work to meet the selected mode.

Symbol No.	Mode	Details of Mode
1 ↑	EJECT	Ejection (to take out cassette)
2	FF/REW	FF (Fast Forward), REW (Rewind), Short FF
3	STOP	Stop, Short REW
4	PLAYBACK	Loading, Unloading
5	BACK SPACE	Playback, Still, Shuttle Search (+), REC (Recording), INSERT (Insertion), After-recording
6	PAUSE	Back spacing
7 ↓	REVERSE	Pause
		REV (Reverse), Shuttle Search (−), Preroll

—————→ : in the Loading direction
 -----→ : in the Unloading direction

Table 7-5-1 Mode shift

1. Stop mode (Symbol No. 3)

1. In this mode, the main brake is in close contact with the clutch to prevent the tape from slackening in the cassette.
2. The take-up idler is fixed at the neutral position by function of the cam (3).

Cam (3) → Slide plate → Relay lever → TU idler
 ↳ Control plate

3. Both the FF brake and REW brake are in contact with the reel disk.
4. The search brake is off the reel disk by function of the cam (1). (Fig. 7-5-5)
5. The pinch roller is positioned considerably apart from the capstan by function of the cam (2). (Fig. 7-5-6)

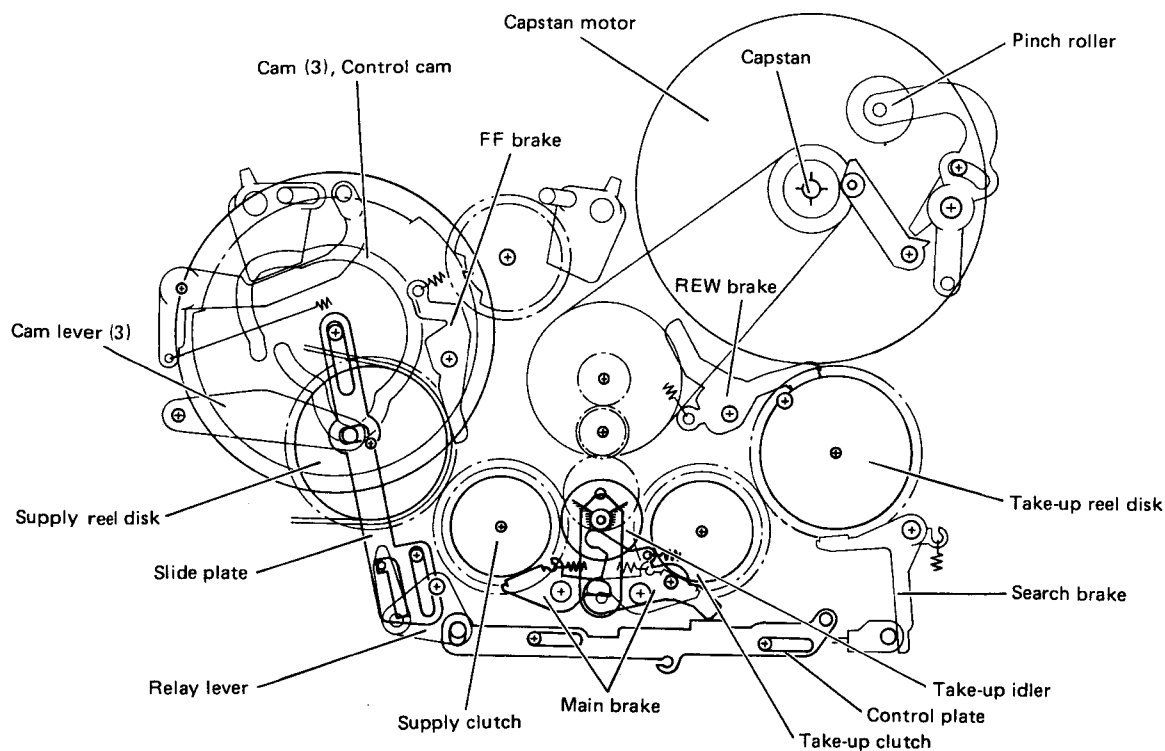


Fig. 7-5-4 Stop mode

2. Loading motion (Symbol Nos. 3 to 4)

1. Not to disturb tape travel from the cassette the main brake is off the clutch by function of the cam (3). (Fig. 7-5-9)
2. As the FF brake and REW brake are in contact with the reel disk, tape is prevented from slackening caused by inertia.
3. The search brake is off the reel disk by function of the cam (1).

Cam (1) → Cam lever (2) → Rod (1) → Rod (2) → Search brake

4. The pinch roller is in contact with the capstan by function of the cam (2). (Fig. 7-5-6)
5. The mode control motor normally rotates to drive the loading ring in order to pull tape out of the cassette.

Mode control motor → Worm → Worm wheel → Control cam → Loading gear → Supply loading ring → Connect gear → Take-up loading ring

6. The take-up gear lays a load on the take-up clutch by gearing into it so that tape is mainly pulled out of the supply side.

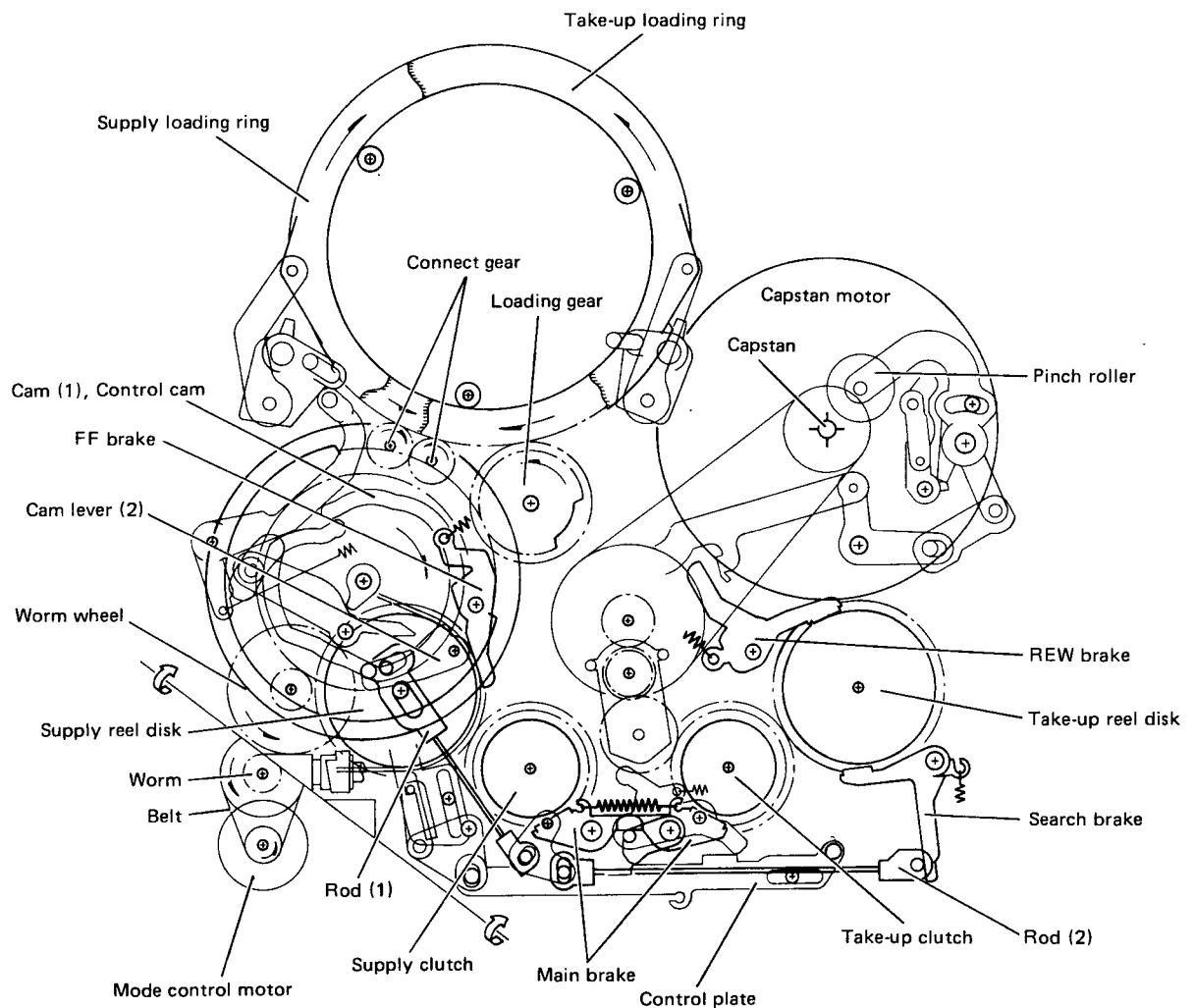


Fig. 7-5-5 Loading motion

3. Playback mode (Symbol No. 4)

1. The main brake is off the clutch by function of the cam (3) not to disturb tape in travel. (Fig. 7-5-9)
2. Both the FF and REW brakes are off the reel disk by function of the cam (2).

Cam (2) → Cam lever (1) → Relay arm → PR plate

- FF brake
- REW brake

3. The search brake is off the reel disk by function of the cam (1). (Fig. 7-5-5)

4. By function of the cam (2) the pinch roller is in contact with the capstan for tape travel.

Cam (2) → Cam lever (1) → Relay arm → PR plate

→ Toggle arm → Pinch roller

5. The capstan motor is rotating to forward and rewind tape. (Fig. 7-5-2)

6. Together with the tension band the tension pole controls back-tension applying it to tape.

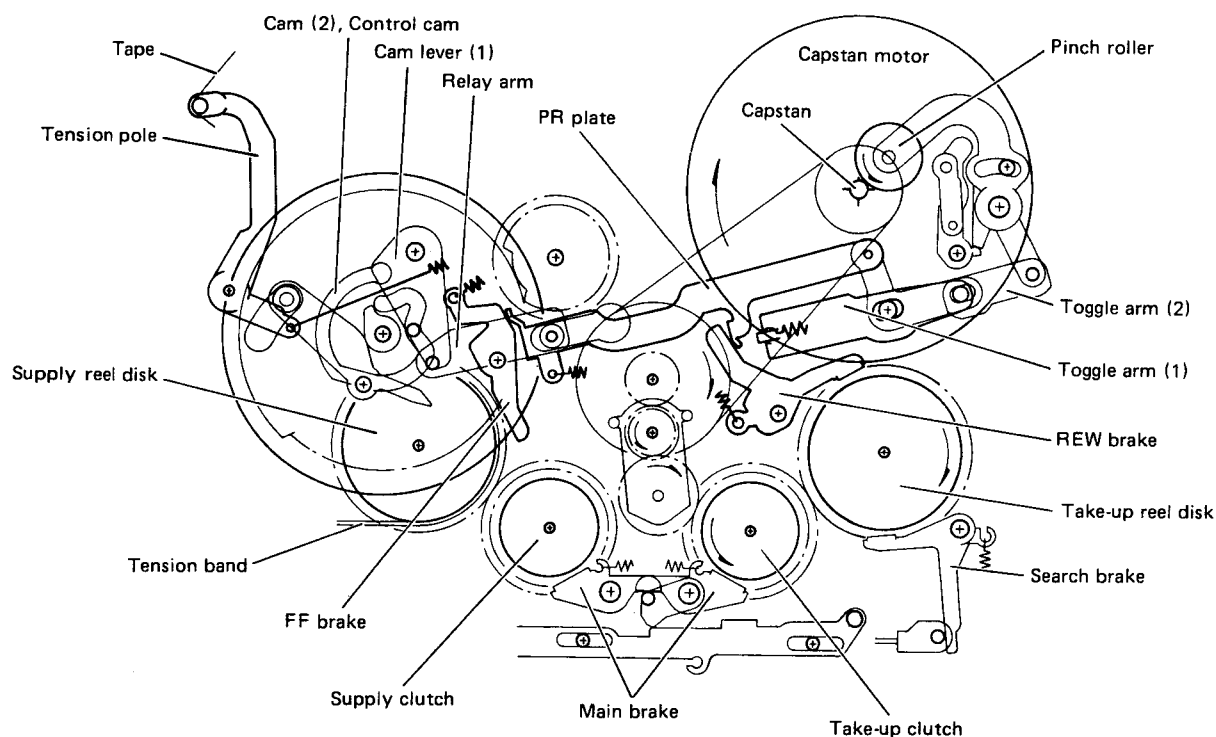
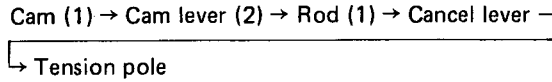


Fig. 7-5-6 Playback mode

4. Pause mode (Symbol No. 6)

1. The main brake is in close contact with the clutch in order to prevent tape from slackening in the cassette.
2. Both FF and REW brakes are in contact with the reel disk.
3. The search brake slightly contacts the reel disk.
4. The tension pole decreases tension to tape by function of the cam (1).



5. Capstan motor is stopping.
6. The pinch roller is slightly off the capstan by function of the cam (2). (Fig. 7-5-6)

5. Back-space mode (Symbol No. 5)

1. Motion in this mode is the same as that in the playback mode except the following items (2) through (4). (Fig. 7-5-6)
2. The search brake slightly contacts the reel disk. (Fig. 7-5-7)
3. The tension pole decreases tension to tape by function of the cam (1). (Fig. 7-5-7)
4. The capstan motor rotates to turn tape travel backwards and rewind the tape by the supply reel disk.

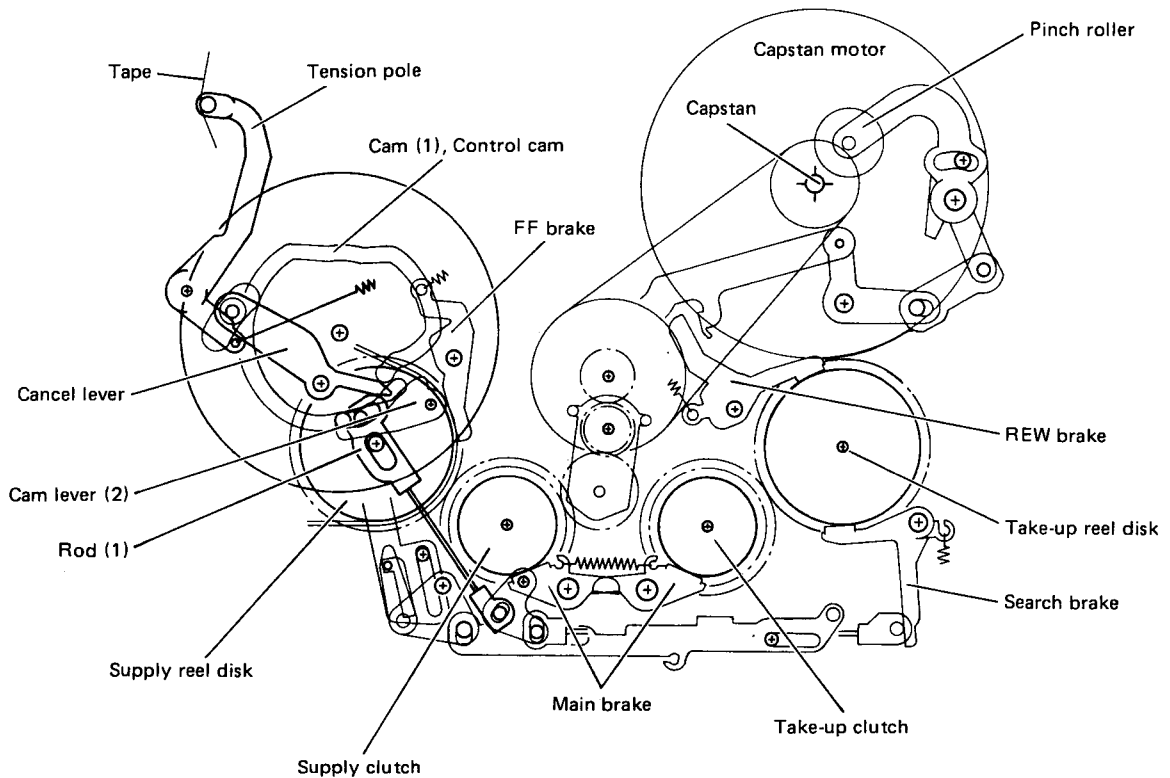


Fig. 7-5-7 Pause mode

6. Reverse mode (Symbol No. 7)

1. The main brake is off the clutch by function of the cam (3). (Fig. 7-5-9)
2. Both the FF and REW brakes are off the reel disk by function of the cam (2). (Fig. 7-5-6)
3. The search brake slightly contacts the reel disk to prevent tape from slackening resulting from inertia.
4. The capstan motor rotates to transport and rewind tape. (Fig. 7-5-2)
5. The tension pole releases tape from back-tension by function of the cam (1).
6. The pinch roller is in contact with the capstan by function of the cam (2) in order to transport tape. (Fig. 7-5-6)

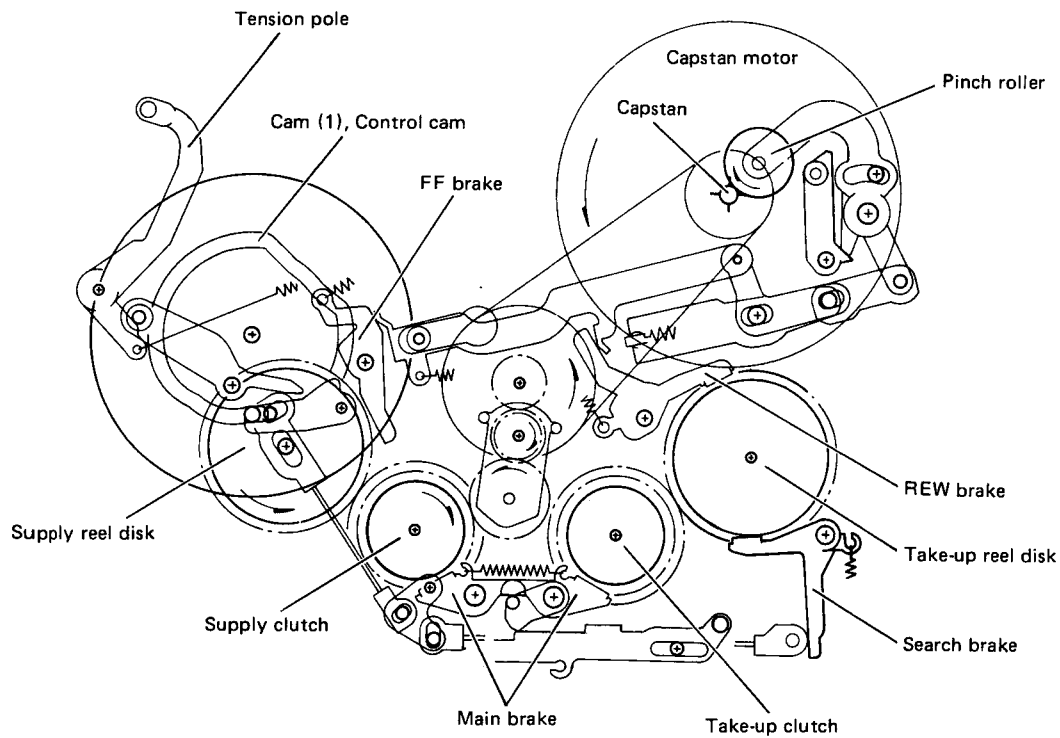


Fig. 7-5-8 Reverse mode

7. FF/REW mode (Symbol No. 2)

1. The main brake is off the clutch by function of the cam (3).

Cam (3) → Slide plate → Relay lever → Control plate
 ↳ Off lever → Main brake

2. The TU gear is fixed at the neutral position by the hold bar according to function of the cam (3).

Cam (3) → Slide plate → Relay lever → Control plate
 ↳ TU idler → Hold lever

3. Both the FF and REW brakes are in contact with the reel disk to prevent tape from inertia resulting from inertia.
4. The search brake is off the reel disk by function of the cam (1). (Fig. 7-5-5)
5. The rod (2) is off the lock plate.
6. The capstan motor rotates to transport tape from the SUP side to the TU reel in the FF mode, for example. (Fig. 7-5-4)
7. The housing arm stud is locked by the lock plate.

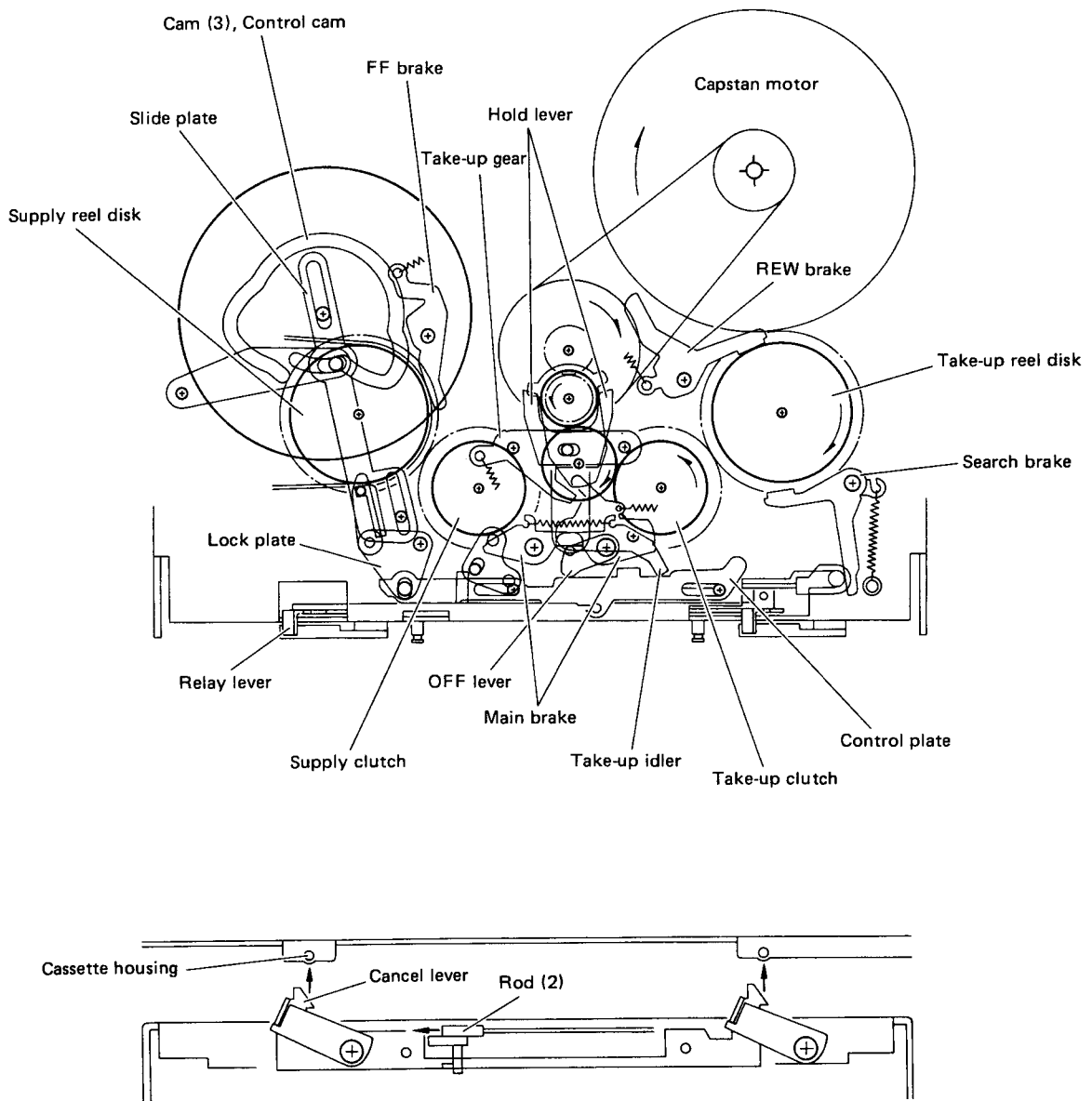


Fig. 7-5-9 FF mode

8. The cam brake is in contact with the brake cam by function of the cam (3).

Cam (3) → Slide plate → Relay lever → Cam brake

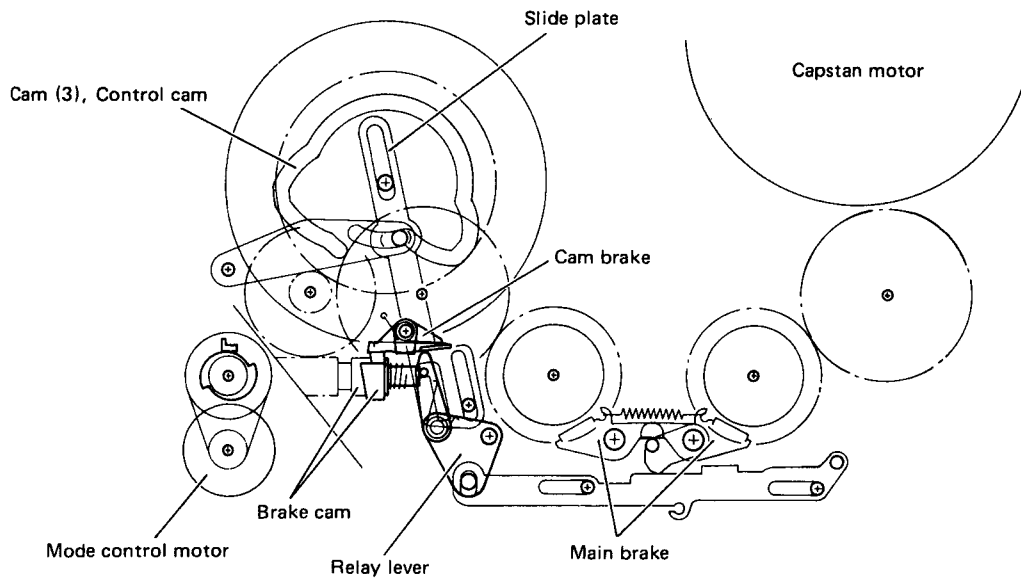


Fig. 7-5-10 FF/REW mode

9. When the mode is changed from the FF/REW to the EJECT, the mode control motor reversely rotates. As a result, the brake cam rotates pushing the cam brake aside. (Reverse rotation: in clockwise direction in the figure)

10. On the other hand, when the mode is changed from this to the STOP, the mode control motor normally rotates and the cam brake stops rotation of the brake cam, which therefore pushes the kick lever to release the relay lever from the slide plate. At this time, the main brake and the capstan brake immediately start in operation.

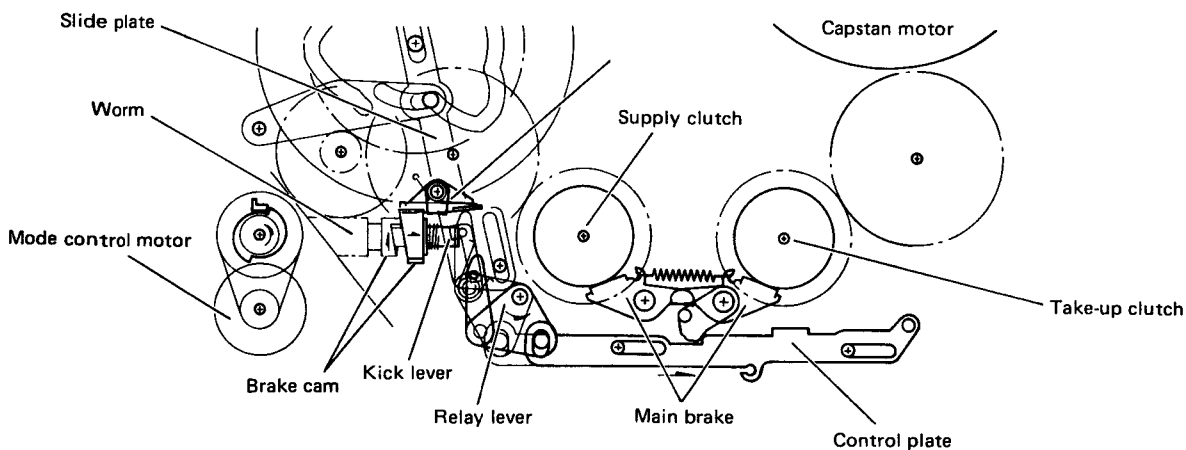
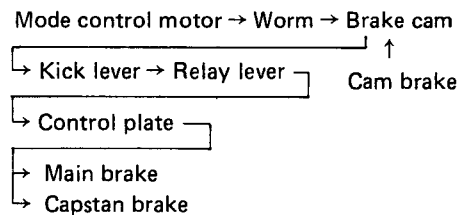
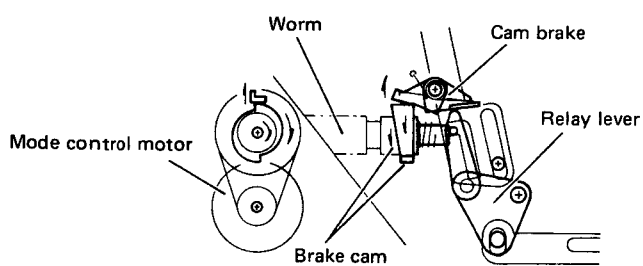
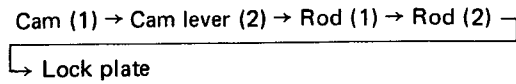


Fig. 7-5-11 Cam brake motion

8. Eject mode (Symbol No. 1)

1. The rod (2) pushes the lock plate by function of the cam (1) in order to release the housing arm stud from the lock plate.



2. The main brake is off the clutch by function of the cam (3). (Fig. 7-5-9)
3. Both the FF and REW brakes are in contact with the reel disk.
4. The search brake is in contact with the reel disk.

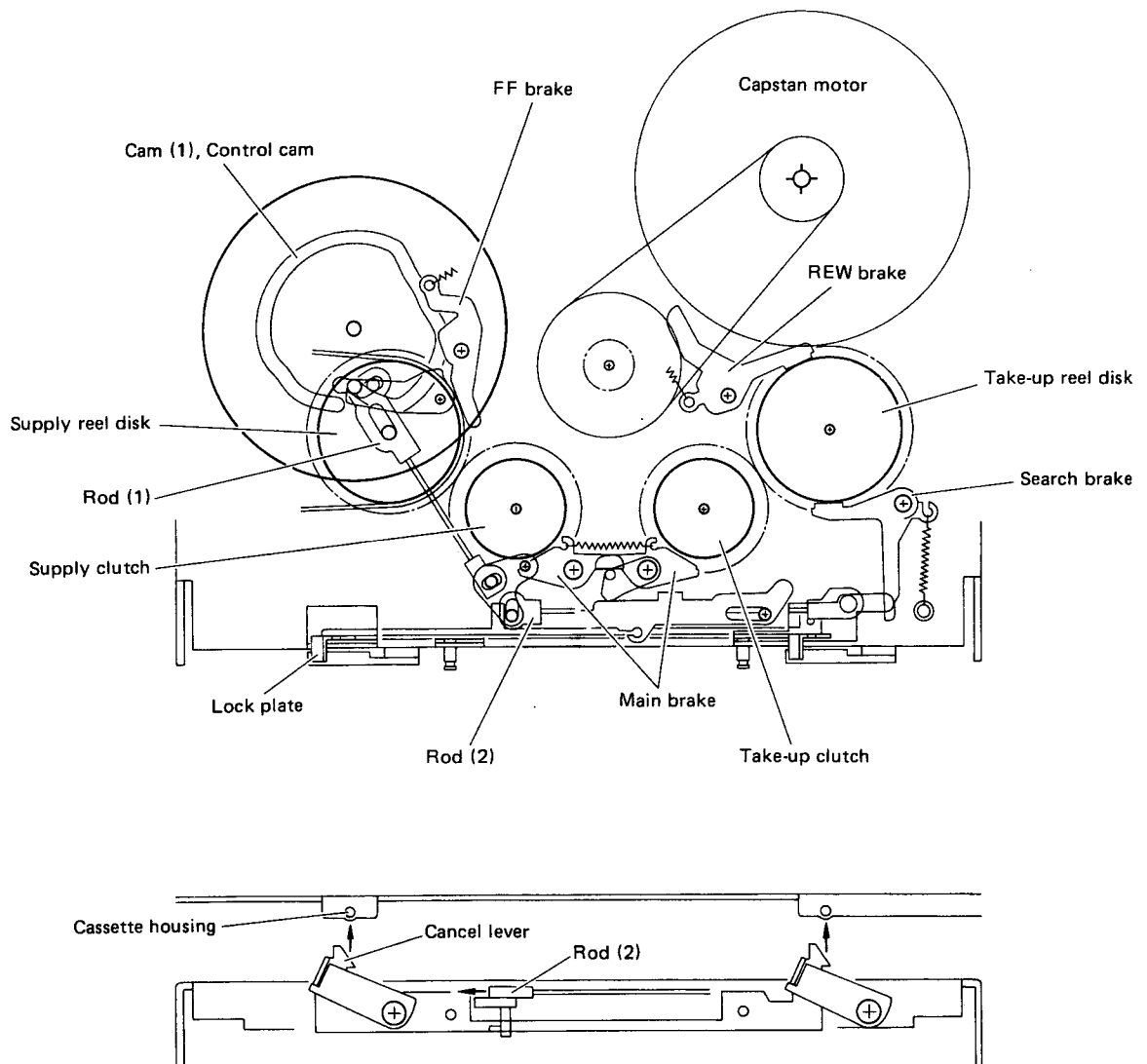
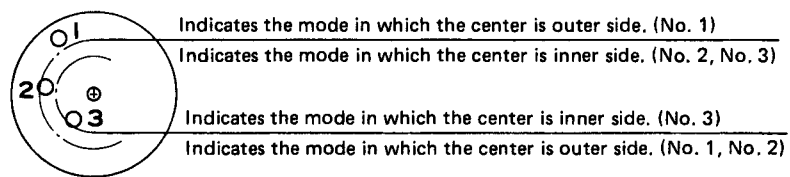
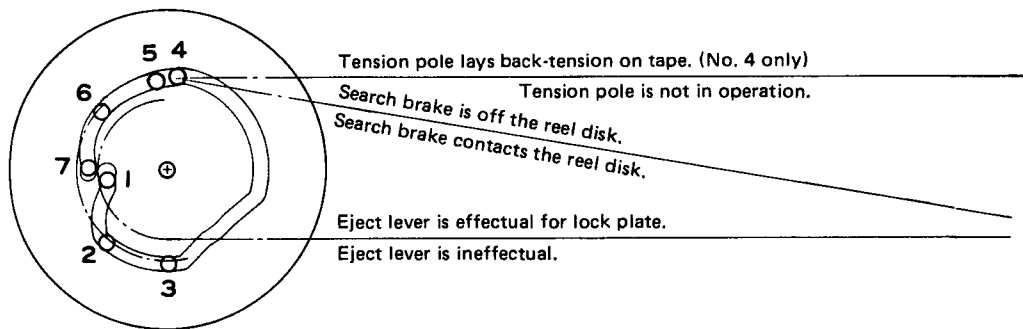


Fig. 7-5-12 Eject mode

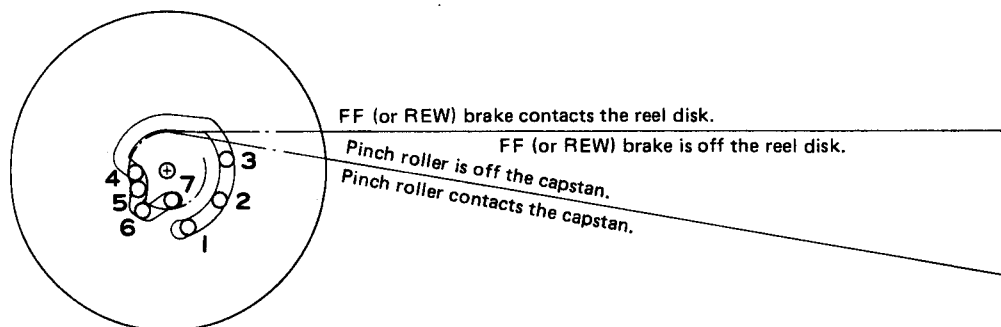
7.5.3 Timing of control cam



— Cam (1) —



— Cam (2) —



— Cam (3) —

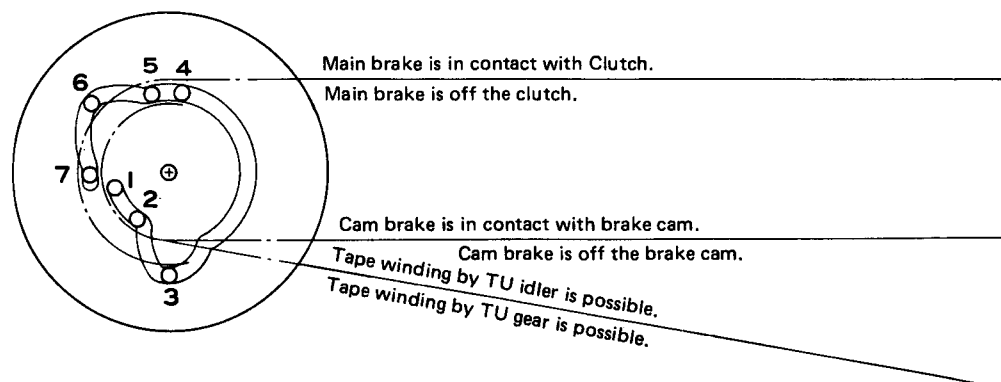


Fig. 7-5-13 Timing of control cam

7.6 TIME CODE GENERATOR CIRCUIT (SA-R200E)

7.6.1 General description

The SA-R200E time code generator which is incorporated in the BR-S422E enables the VTR to write in VITC and LTC time codes conformable to the SMPTE standard.

For recording LTC data the AUD-2 head of the normal audio is used.

When it is intended to record time code in the REC RUN mode, set the AEF switch to the NORMAL position (for zero frame editing) since this VTR is not equipped with any time code reader circuit. When the AEF switch is set to the QUICK

position in recording, editing point is overlapped and time code is not continuously recorded.

For detail of the time codes, refer to the Video Technical Guide of the BR-S822E.

7.6.2 Time code generator circuit

IC1 functions as the time code generator that generates two time code signals of LTC and VITC. LTC output (LTCO) and VITC output (XVTO) are output in the timing as shown in Fig. 7-6-2.

The timing that the syscon presets data to the time code generator is shown in Fig. 7-6-3.

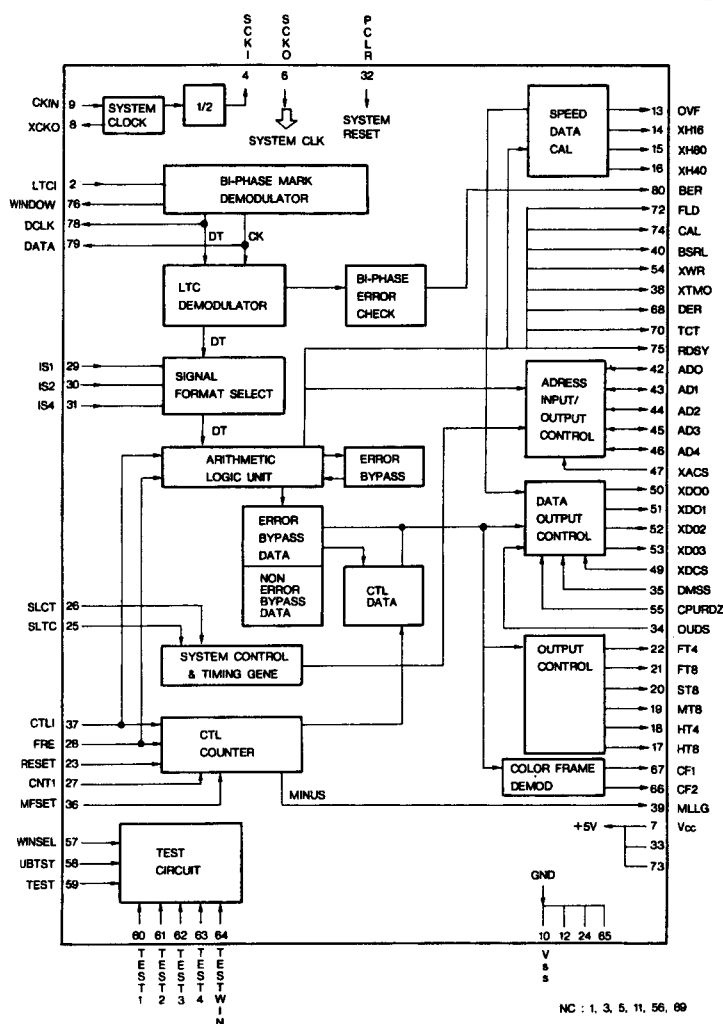


Fig. 7-6-1 VC2067A

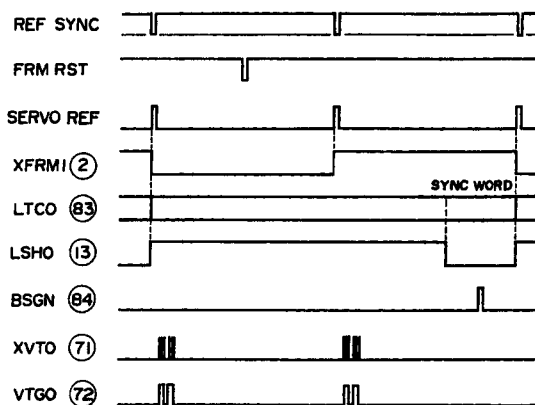


Fig. 7-6-2 Time code generator timing chart

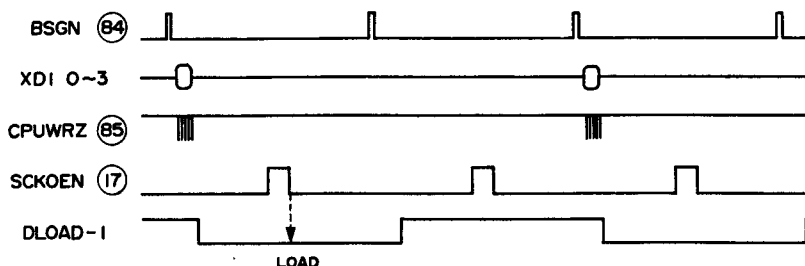


Fig. 7-6-3 Data preset timing chart

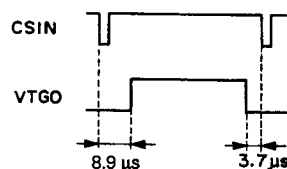
Pin No.	Pin Name	I/O	Description																														
1, 26, 47, 70, 90, 107	GND	I	GND																														
2	XFRMI	I	Frame signal input																														
6	VDI	I	V. sync drive input																														
7	VDO	O	V. sync drive output																														
VD signal separated from CSIN signal of pin⑩																																	
8	HDI	I	H. sync drive input																														
9	HDO	O	H. sync drive output																														
HD signal separated from CSIN signal of pin⑩																																	
10	CSIN	I	Composite sync signal input																														
12	LSHI	I	LTC synchronous signal "H" input																														
13	LSHO	O	LTC synchronous signal "H" output																														
To synchronize start bit of LTC output with video signal.																																	
14	LCKI	I	LTC clock input - To generate LTC sync signal (x1 speed : 8.0 kHz)																														
19	LSBO	O	LTC sync signal B output																														
20	LSCO	O	LTC sync signal C output																														
21	LSDO	O	LTC sync signal D output																														
Synchronizing with output LTC. External multiplexer is controlled with these signals to input serial signal to input port of pin ②② - ②⑤ .																																	
22	PORT A	I	Serial signal input ports																														
23	PORT B	I																															
24	PORT C	I																															
25	PORT D	I																															
27	IS1	I	INPUT SIGNAL FORMAT SELECT 1																														
28	IS2	I	INPUT SIGNAL FORMAT SELECT 2																														
29	IS4	I	INPUT SIGNAL FORMAT SELECT 4																														
<table><tr><th>DF/NDF SW</th><th>S1</th><th>S2</th><th>S4</th><th>Signal Name</th><th>System</th></tr><tr><td>DF</td><td>H</td><td>H</td><td>H</td><td>NTSC DROP FRAME</td><td>525/60</td></tr><tr><td>NDF</td><td>L</td><td>H</td><td>H</td><td>NTSC NON-DROP FRAME</td><td>525/60</td></tr><tr><td>—</td><td>L</td><td>L</td><td>H</td><td>PAL/SECAM</td><td>625/50</td></tr><tr><td>—</td><td>L</td><td>L</td><td>L</td><td>FILM</td><td>655/48</td></tr></table>				DF/NDF SW	S1	S2	S4	Signal Name	System	DF	H	H	H	NTSC DROP FRAME	525/60	NDF	L	H	H	NTSC NON-DROP FRAME	525/60	—	L	L	H	PAL/SECAM	625/50	—	L	L	L	FILM	655/48
DF/NDF SW	S1	S2	S4	Signal Name	System																												
DF	H	H	H	NTSC DROP FRAME	525/60																												
NDF	L	H	H	NTSC NON-DROP FRAME	525/60																												
—	L	L	H	PAL/SECAM	625/50																												
—	L	L	L	FILM	655/48																												
30	PCLR	I	Power ON clear input																														
49	LTCI	I	LTC input Time code input only in normal bit rate (x1 speed)																														
63	BSCT	O	BUSY CTL signal output H : During control data output just after CTL pulse fall																														
64	CTLI	I	CTL signal input CTL counter is stepped up at this trailing edge.																														
65	FWRE	I	CTL direction signal input FWD/REV To input signal indicating tape transport direction at stepup by CTLI signal																														
66	CTLRST	I	CTL reset signal input																														
67	DLOD3	I	DATA LOAD 3 input Signal input to load control data with XD10-3																														
68	CTCT	I	CTL counter mode select input H : 24H mode, L : 10H mode																														
69	CTLDI	I	CTL DISENABLE - Input signal to inactivate pin ⑥③ BSCT H : BSCT inactivated (CTL data is output when pin ⑧④ BSGN is "H".)																														
71	XVTO	O	VITC output																														
72	VTGO	O	VITC gate signal output H : VITC insertion line																														

CSIN

VTGO

8.9 μs

3.7 μs



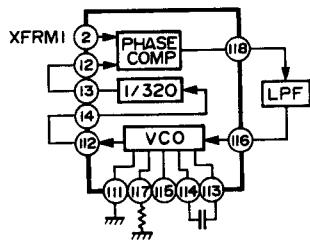
Pin No.	Pin Name	I/O	Description
82	LTCPHASE	I	LTC phase select input
83	LTCO	O	LTC output
84	BSGN	O	BUSY GENERATOR Output in and around center of LTC SYNC WORD. Data access inhibited during this output
85	CPUWRZ	I	CPU write signal input Signal input to get CPU to load data directly to XDI1-3
86	XDI3 (MSB)	I	Data input Signal input for direct loading of 4 bits hexadecimal data such as time data, user's bit data, CTL data
87	XDI2	I	
88	XDI1	I	
89	XDI0 (LSB)	I	
91	AD0	I/O	Address data input/output · Address signal output to indicate output data · Address signal input for data access to internal RAM and MPX.
92	AD1	I/O	
93	AD2	I/O	
94	AD3	I/O	
95	AD4	I/O	
96	AD5	I/O	
97	XACS	I	Address line output enable H : Address output terminals are OFF (high impedance)
98	XDO0 (LSB)	O	Data output (4 bits hexadecimal data) Generation data or CTL data is output depending on mode.
99	XDO1	O	
100	XDO2	O	
101	XDO3 (MSB)	O	
102	XDCS	I	Data line output enable H : Data output terminals XDO0-3 getting high impedance
104	CPURDZ	I	CPU read signal input Signal input to enable CPU to strobe output signal of XDO0-3
105	CLK7MO	O	7 MHz clock output (Inversion output of clock that pin (109) CKIN signal is half divided)
106	SLCK	I	Select clock input To select CKIN frequency. L : 14.500 MHz, H : 7.250 MHz
108	XCKO	O	Clock output (Inversion output of pin (109) CKIN signal)
109	CKIN	I	System clock input (14.500 MHz)
111	INH1	O	
112	VCOOUT	I	
113	CIB	I	
114	CIA	I	
115	R2	I	
116	VCOIN	I	
117	R1	I	
118	PHCOUT	O	

Table 7-6-1 IC1 time code generator (VC2067A) pin functions

Each port of pins (22) to (25) of IC1 time code generator is supplied with 8-bit serial signal which is generated by converting parallel signal into serial signal by the multiplexers of IC7 to IC10. At that time, the multiplexers are controlled by LSBO, LSCO and LSDO outputs from pins (19) to (21) of IC1.

Pin No.	Signal Name	Description									
		0	1	2	3	4	5	6	7		
18	SCK O										
19	LSB O										
20	LSC O										
21	LSD O										
22	PORT A	H	TC/UB	UB/RT	TC/UB/CTL	RT	UB	RESET	RUN/HOLD	BM	
		L	TC	UB	TC/UB	OFF	VITC	OFF	RUN	OFF. (DIP SW 3-1)	
23	PORT B	H	SLAVE	SSELO	SSELI	SLEB	ERCLR	DLOD1	DLOD2	VITC	
		L	OFF	RESET	RESET	2	OFF	DATA LOAD (TC)	DATA LOAD (UB)	E1 JP1 E2	
24	PORT C	H	AS 1	AS 2	AS 3	AS 4	AS 5	AS 6	AS 7	AS 8	
		L	RESET	RESET (CF)	RESET (BM)	RESET	RESET	RESET	4FIELD	FIELD INPUT	
25	PORT D	SW1A		SW2A	SW3A	SW4A	SW1B	SW2B	SW2C	SW2D	
		SW1A/SW1B		L	H	L	H	L	H	L	H
		SW2A/SW2B		L	L	H	H	L	L	H	H
		SW3A/SW3B		L	L	L	H	H	H	H	H
		SW4A/SW4B		L	L	L	L	L	H	H	H
		VITC INSERTION LINE No.		22	21	20	19	18	17	16	15
				14	13	12	11	10	9	8	7

Note 2: Port C controls on/off of assigned bits. AS1 to AS6 are assigned to the following bits.

Table 7-6-2

TIME CODE GENERATOR

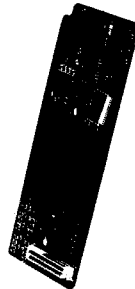
SA-R200E

INSTRUCTIONS

JVC
SA-R200E
TIME CODE GENERATOR



Printed in Japan
PGD00002-439



PGD00002-439
(E)

WARNING:

**TO PREVENT FIRE OR SHOCK HAZARD,
DO NOT EXPOSE THIS APPLIANCE TO
RAIN OR MOISTURE.**

CAUTION:

To prevent electric shocks and fire hazards, do NOT
use any other power source.

NOTE:

The rating plate (serial number plate) is on the board.

CONTENTS

- Installation
- Controls And Operations
- Time Code Setting
- User Bit Setting
- Specifications

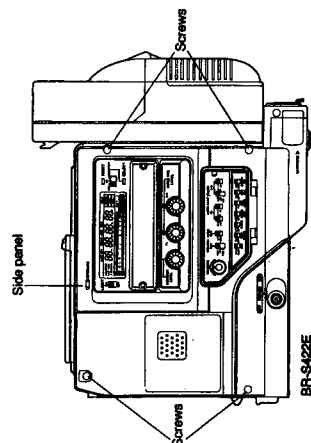
The SA-R200E is a time code generator board specifically designed for installation in the BR-S422E EBU-standard LTC or VITC time code recording is possible. (LTC is recorded on the AUD-2 normal audio track.)

- The AEF switch should be set to "NORMAL" in the Rec Run mode, otherwise time code continuity will be lost at the edit point.
- If the time code has run for more than 30 minutes in the Free Run mode, it will keep running for at least 30 minutes even after the recorder's power is turned off.
- The SA-R200E can also be installed in the JVC GY-X2E colour video camera. For installation, consult a JVC service centre or authorised JVC service agent.

INSTALLATION

This section describes how to install the SA-R200E in the BR-S422E. For more details on installation, consult your local JVC service agent.

1. Remove the 4 screws from the side panel (controls and switches section of BR-S422E).



2. Open the side panel as illustrated.

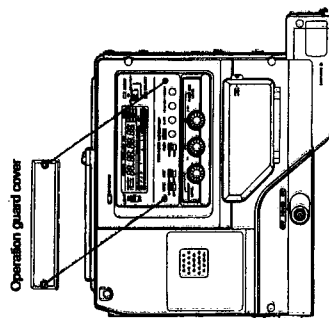
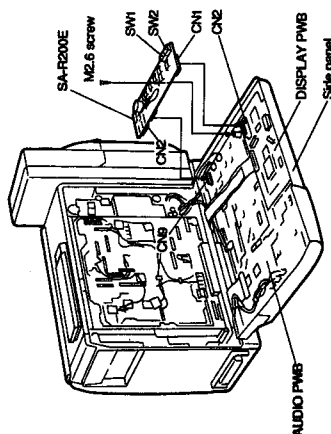
3. Select the lines on which VITC data is to be inserted with the rotary switches SW 1/SW 2 on the SA-R200E.

No. of switch	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Insertion line	7H	9H	10H	11H	12H	13H	14H	15H	16H	17H	18H	19H	20H	21H	22H	23H

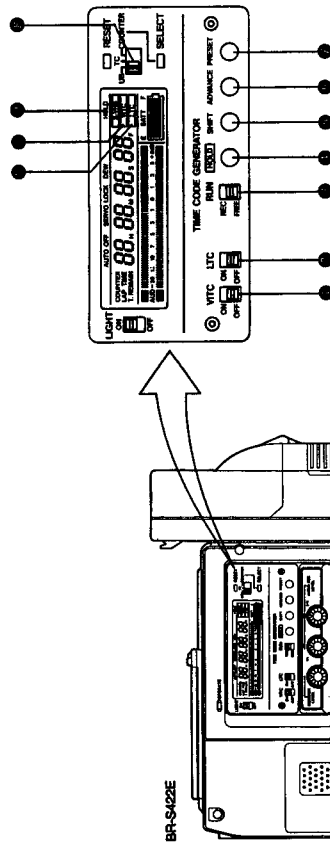
Factory preset SW 1: C (19H)
SW 2: E (21H)

The BR-S422E is preset to add the AEO (Automatic Equalizer) reference signal to line 11. Do not select line 11 for VITC insertion. If you want to defeat the AEO signal or change its insertion line, consult a JVC service centre or authorised JVC service agent.

4. Attach the SA-R200E to the recorder by connecting the CN 1 connector on the SA-R200E to the CN 2 connector on the side panel's DISPLAY PWB and the CN 2 connector on the SA-R200E to the CN 9 connector on the side panel's AUDIO PWB. Secure them with the M 2.6 screw as illustrated.
5. Replace the side panel and fasten the four screws.
6. Remove the 2 screws from the operation guard cover and detach it to facilitate setting of the SA-R200E.



CONTROLS AND OPERATIONS



- **VTC ON/OFF switch**
ON: To record VTC time codes.
OFF: VTC time codes are not recorded.
- **LTC ON/OFF switch**
ON: To record LTC time codes. When set to this position, AUD-2 normal audio cannot be recorded.
OFF: LTC time codes are not recorded.
- **REC RUN/FREE RUN switch**
REC: The time code runs only during recording. (Rec Run mode; used to time the recording)
FREE: The time code runs in real time, regardless of the recorder's operating mode. (Free Run mode; used when operating in real time, as a clock)
- **HOLD button**
● Used when setting the time codes and user bits.
● **SHIFT button**
● Shifts the blinking digit to the right.
- **ADVANCE button**
● Advances the value of the blinking digit.
- **PRESET button**
● Transfers the data set with the HOLD, SHIFT, and ADVANCE buttons to the time code generator.
- **UB/TCCOUNTER select switch**
● Selects the display mode on the counter.
UB: Displays user bits.
TC: Displays time code data
COUNTER: Displays tape counter modes selected with the SELECT button.
- **HOLD indicator**
● Comes on when the HOLD button is pressed.
- **VTC indicator**
● Comes on when VTC is recorded.
- **LTC indicator**
● Comes on when LTC is recorded.

TIME CODE SETTING

Either the current time or any required time can be set.

1. Set the ● REC RUN/FREE RUN switch as desired.
2. Set the ● UB/TCCOUNTER select switch to "TC".
3. Press ● HOLD for more than 2 seconds.
● The counter resets with the leftmost digit blinking.

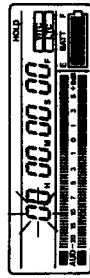
6. Repeat steps 4 and 5 until all data is set.
The maximum setting range is 23:59:59.24. Any value that exceeds this will be rejected.

7. Press ● PRESET

- The preset data will be transferred to the time code generator. The HOLD indicator goes off and the counter stops blinking.
- In the Free Run mode, time code starts running.
- In the Rec Run mode, time code starts running when the Record mode is engaged.

NOTES:

- When you want to correct the data, repeat steps 3 to 7.
- If you mistakenly press the HOLD button, press it again to cancel.



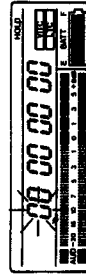
4. Press ● ADVANCE

- This advances the value of the blinking digit. Set to the desired value.
- 5. Press ● SHIFT.
● The blinking digit shifts to the right.

USER BIT SETTING

"User bits" is a portion of the time code signal allocated to the user. It can be used to record the operator number or reel numbers. User bits are an 8-digit hexadecimal number, each digit of which can have values from "0" to "F". User bits are recorded on the tape together with time data.

1. Set the ● UB/TCCOUNTER select switch to "UB".
2. Press ● HOLD for more than 2 seconds.
● Counter shows "00 00 00" with leftmost digit blinking.
● The Hold indicator will light.



3. Press ● ADVANCE to set the value of the blinking digit as desired.
● All 8 digits can be changed from "0" to "F".
4. Press ● SHIFT to move the blinking digit.
5. Repeat steps 3 and 4 until all data is set.
6. Press ● PRESET.
● The preset data will be transferred to the time code generator.
● Hold indicator goes off and the counter stops blinking.
● User bit data will not change regardless of the setting of the REC RUN/FREE RUN switch.

NOTES:

- When you want to correct the data, repeat steps 2 to 6.
- If you mistakenly press the HOLD button, press it again to cancel.

SPECIFICATIONS

Signal system : EBU-standard
Time set : 8 digits (hours, minutes, seconds, frames)
User bits : 8 digits

Power consumption : 0.05 W
Weight : approx. 30g
Provided accessory : M2.6 screw x 1

SECTION 1 DIAGRAM AND CIRCUIT BOARD

Refer to the following items and pages of the service manual for the BR-S422U (No. 9277).

- | | |
|-----------------------|-----------|
| (1) SCHEMATIC DIAGRAM | Page 4-38 |
| (2) CIRCUIT BOARD | Page 4-39 |

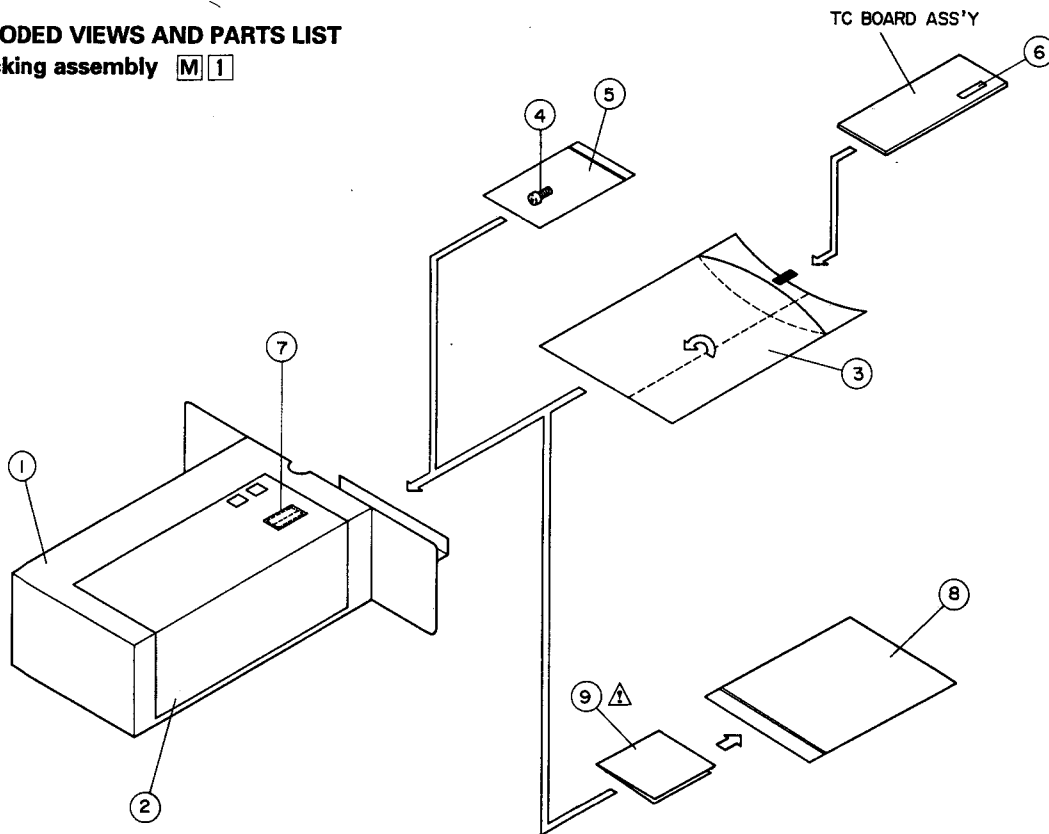
SECTION 2 EXPLODED VIEWS AND PARTS LIST

SAFETY PRECAUTION

Parts identified by the Δ symbol are critical for safety. Replace only with specified part numbers.

2.1 EXPLODED VIEWS AND PARTS LIST

2.1.1 Packing assembly $\boxed{M1}$



Packing assembly < M1 >

#	Δ REF No.	PART No.	PART NAME, DESCRIPTION

PACKING ASSEMBLY < M1 >

1	PRD30078	PACKING CASE
2	PRD30092-20	PACKING LABEL
3	PRD30413-01-04	AIR CAP BAG
4	SPSP2606Z	SCREW
5	QPGB005-00704	POLY BAG
6	PRD30072-66	STICKER
7	PUP40329	SERIAL NO.STICKER
8	QPGB010-01404	POLY BAG
Δ 9	PGD30002-439	INSTRUCTION SHEET

SECTION 3 ELECTRICAL PARTS LIST

SAFETY PRECAUTION

Parts identified by the Δ symbol are critical for safety. Replace only with specified part numbers.

TIME CODE GENERATOR BOARD ASSY < 09 >

<09>

# Δ REF No.	PART No.	PART NAME, DESCRIPTION	

TIME CODE GENERATOR BOARD ASSY < 09 >			
PWBA	PRK20168B-03	TC GENERATOR BOARD ASSY, PAL	
IC1	VC2067A	IC	
IC2	TC4021BF	IC	
IC3	TC4021BF	IC	
IC6	TC4S69F	IC	
IC7	TC74HC08AF	IC	
IC8	TC4051BF	IC	
IC9	TC4051BF	IC	
IC10	TC4051BF	IC	
IC11	TC4051BF	IC	
Q1	DTC144EU	TRANSISTOR	
R1	NRSA63J-103N	RESISTOR	10K Ω , 1/16W
R2	NRSA63J-103N	RESISTOR	10K Ω , 1/16W
R3	NRSA63J-224N	RESISTOR	220K Ω , 1/16W
R4	NRSA63J-0R0N	RESISTOR	0 Ω , 1/16W
R5	NRSA63J-104N	RESISTOR	100K Ω , 1/16W
R6	NRSA63J-104N	RESISTOR	100K Ω , 1/16W
R7	NRSA63J-103N	RESISTOR	10K Ω , 1/16W
R8	NRSA63J-103N	RESISTOR	10K Ω , 1/16W
R9	NRSA63J-0R0N	RESISTOR	0 Ω , 1/16W
R10	NRSA63J-0R0N	RESISTOR	0 Ω , 1/16W
R11	NRSA63J-104N	RESISTOR	100K Ω , 1/16W
R12	NRSA63J-104N	RESISTOR	100K Ω , 1/16W
R14	NRSA63J-103N	RESISTOR	10K Ω , 1/16W
R15	NRSA63J-103N	RESISTOR	10K Ω , 1/16W
R16	NRSA63J-103N	RESISTOR	10K Ω , 1/16W
R17	NRSA63J-103N	RESISTOR	10K Ω , 1/16W
R18	NRSA63J-104N	RESISTOR	100K Ω , 1/16W
R19	NRSA63J-104N	RESISTOR	100K Ω , 1/16W
R20	NRSA63J-104N	RESISTOR	100K Ω , 1/16W
R21	NRSA63J-104N	RESISTOR	100K Ω , 1/16W
R22	NRSA63J-103N	RESISTOR	10K Ω , 1/16W
R23	NRSA63J-103N	RESISTOR	10K Ω , 1/16W
R24	NRSA63J-103N	RESISTOR	10K Ω , 1/16W
R25	NRSA63J-103N	RESISTOR	10K Ω , 1/16W
R26	NRSA63J-104N	RESISTOR	100K Ω , 1/16W
R27	NRSA63J-104N	RESISTOR	100K Ω , 1/16W
R28	NRSA63J-104N	RESISTOR	100K Ω , 1/16W
R29	NRSA63J-104N	RESISTOR	100K Ω , 1/16W
R30	NRSA63J-104N	RESISTOR	100K Ω , 1/16W

# Δ REF No.	PART No.	PART NAME, DESCRIPTION	
R31	NRSA63J-104N	RESISTOR	100K Ω , 1/16W
R32	NRSA63J-104N	RESISTOR	100K Ω , 1/16W
R33	NRSA63J-104N	RESISTOR	100K Ω , 1/16W
R34	NRSA63J-102N	RESISTOR	1K Ω , 1/16W
R36	NRSA63J-105N	RESISTOR	1M Ω , 1/16W
R37	NRSA63J-105N	RESISTOR	1M Ω , 1/16W
R38	NRSA63J-273N	RESISTOR	27K Ω , 1/16W
R39	NRSA63J-223N	RESISTOR	22K Ω , 1/16W
R40	NRSA63J-223N	RESISTOR	22K Ω , 1/16W
R48	NRSA63J-562N	RESISTOR	5.6K Ω , 1/16W
R51	NRSA63J-103N	RESISTOR	10K Ω , 1/16W
R52	NRSA63J-224N	RESISTOR	220K Ω , 1/16W
R53	NRSA63J-103N	RESISTOR	10K Ω , 1/16W
R54	NRSA63J-103N	RESISTOR	10K Ω , 1/16W
R55	NRSA63J-103N	RESISTOR	10K Ω , 1/16W
R56	NRSA63J-103N	RESISTOR	10K Ω , 1/16W
R57	NRSA63J-104N	RESISTOR	100K Ω , 1/16W
R58	NRSA63J-104N	RESISTOR	100K Ω , 1/16W
R59	NRSA63J-104N	RESISTOR	100K Ω , 1/16W
R60	NRSA63J-104N	RESISTOR	100K Ω , 1/16W
R61	NRSA63J-104N	RESISTOR	100K Ω , 1/16W
R62	NRSA63J-104N	RESISTOR	100K Ω , 1/16W
R63	NRSA63J-104N	RESISTOR	100K Ω , 1/16W
R64	NRSA63J-104N	RESISTOR	100K Ω , 1/16W
R65	NRSA63J-103N	RESISTOR	10K Ω , 1/16W
R66	NRSA63J-103N	RESISTOR	10K Ω , 1/16W
R67	NRSA63J-103N	RESISTOR	10K Ω , 1/16W
R68	NRSA63J-103N	RESISTOR	10K Ω , 1/16W
R69	NRSA63J-104N	RESISTOR	100K Ω , 1/16W
R70	NRSA63J-103N	RESISTOR	10K Ω , 1/16W
R71	NRSA63J-103N	RESISTOR	10K Ω , 1/16W
R72	NRSA63J-103N	RESISTOR	10K Ω , 1/16W
R73	NRSA63J-103N	RESISTOR	10K Ω , 1/16W
R74	NRSA63J-103N	RESISTOR	10K Ω , 1/16W
R75	NRSA63J-104N	RESISTOR	100K Ω , 1/16W
R76	NRSA63J-103N	RESISTOR	10K Ω , 1/16W
R77	NRSA63J-103N	RESISTOR	10K Ω , 1/16W
R78	NRSA63J-104N	RESISTOR	100K Ω , 1/16W
R80	NRSA63J-333N	RESISTOR	33K Ω , 1/16W
R81	NRSA63J-104N	RESISTOR	100K Ω , 1/16W
R82	NRSA63J-0R0N	RESISTOR, PAL	0 Ω , 1/16W
R83	QRSA08J-221YN	RESISTOR	220 Ω , 1/10W
R84	QRSA08J-221YN	RESISTOR	220 Ω , 1/10W
R85	QRSA08J-221YN	RESISTOR	220 Ω , 1/10W
R86	QRSA08J-221YN	RESISTOR	220 Ω , 1/10W
R87	NRSA63J-0R0N	RESISTOR	0 Ω , 1/16W

<09>

#△	REF No.	PART No.	PART NAME, DESCRIPTION	
	C1	QERF0JM-476	E CAPACITOR	47μF,6.3V
	C2	NCF31CZ-104A	CAPACITOR	0.1μF,16V
	C3	QERF0JM-476	E CAPACITOR	47μF,6.3V
	C4	NCB31EK-103A	CAPACITOR	0.01μF,25V
	C5	NCS31HJ-120A	CAPACITOR	12PF,50V
	C6	NCB31HK-332A	CAPACITOR	0.0033μF,50V
	C7	NCS31HJ-270A	CAPACITOR	27PF,50V
	C8	NCS31HJ-100A	CAPACITOR	10PF,50V
	C9	NCB31HK-222A	CAPACITOR	0.0022μF,50V
	C10	QERF1EM-475	E CAPACITOR	4.7μF,25V
	C13	QEA40HZ-105	E CAPACITOR (DOUBLE)	1F,5.5V
△	C14	QCF11HP-103	CAPACITOR, PAL	0.01μF,50V
△	X1	PGZ01103	CRYSTAL RESONATOR, PAL	
	SW1	QSR0096-L03	ROTARY SWITCH, VITC LINE SEL	
	SW2	QSR0096-L03	ROTARY SWITCH, VITC LINE SEL	
	TP1	PGZ01015	TEST PIN, X5(TP1-3,5,7)	
	CN1	PGZ01715-050	CONNECTOR	
	CN2	YU40772-12	CONNECTOR	